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McGraw-Hill Co., Inc. April 5, 1924 Twenty Cents Per Copy

# ELECTRIC RAILWAY JOURNAL

In G. S. P. Ind.

U. 63
Apr.-June
1924.
Nos. 14-26

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New York, April 5, 1924

Electric Railway Journal

*Consolidation of Street Railway Journal and Electric Railway Review*

Published by McGraw-Hill Company, Inc.

Henry W. Blake and Harry L. Brown, *Editors*

*Volume 63*
*Number 14*

## 'Tis the Spirit of Terry O'Toole, We Need

WHEN Terry O'Toole discarded the bricks in Erin and brought blarney to Americky, he laid the foundation for a public-be-pleased policy which embodied loyalty, service and sacrifice rather than duplicity, indifference and compromise. There were three beneficiaries when the earthly day of reckoning came—his employer, the public and himself.

There is a lesson for trainmen everywhere in the tale of Terry O'Toole, a one-man car operator in Loteda, Ohio. He ran the car, rang up the fares, helped patrons up the step, carried the babies, later depositing them in the mothers' laps, trained the fender to scoop up bodies which were on the point of landing in the next world, ran into a burning building to save his aged father and became the owner of two shares of the traction company's stock. All this he did and even more. He won the fair daughter of the president of the railway, and that terminated his fare-collecting days.

Unfortunately, Terry O'Toole can't be located for confirmation of the story. The Loteda Traction Company never employed a motorman of that name, for the Loteda Traction and Terry O'Toole are only screen realities in "Conductor 1492," produced by Warner Brothers. But an hour watching Terry at work will probably do trainmen more good than a score of service sermons and a billion booklets on courteous conductors.

With a good start and a definite objective Terry was sure to be a success, and a smiling one, too. His getting on in the world was an accomplishment in thought long before it was a reality. Back in the old country, when his father and grandfather were fighting (not discussing) whether they would send Terry to the United States or to Americky to try his luck, the hero of the plot was dreaming of trolleys, tracks and traffic. Terry knew the secret of success was service, civility and loyalty. Then, too, Terry liked his work. He knew that one used many more muscles to frown than to smile, and he didn't believe in working overtime. Though Irish enough to have a temper all his own, he never showed it. Rather did he show up his tempters and turn the tables, but never the trolley, on them. On one occasion, when all his passengers talked at him at once, he pulled down a shade on which was written "$50 Fine for Talking to the Motorman." With equal finesse did he spurn a lift in the vice-president's seven-passenger Cadillac, declining graciously with "No, thanks, I prefer my fifty-passenger car."

The lesson of Terry has been told many times in many ways. His methods are worth trying even if the measure of success is not often so great as was Terry's, for not every president's daughter can win a motorman. But every operator of a one-man car or a conductor on a two-man car can bring credit to himself, prestige to his company and satisfaction to his public. The trainmen are the real salesmen of service, with the company backing them up. The industry has another proof of this is in Terry O'Toole.

## Saginaw Benefits by Car-Bus Franchise

CO-ORDINATION of car and bus, as exemplifield by the Saginaw operation under the new franchise which brought the trolleys back after two years cessation of service, perhaps offers a solution for the transportation agitations prevalent in some of the smaller cities today. Placing the bus under the management of the railway and giving the community a voice in the operation of the combined system has satisfied the people of Saginaw and resulted in unprecedented patronage during the first three months of operation, as noted in the article on page 531.

What has taken place during the last two years in Saginaw may be taken as indicative of what will occur in other municipalities if the street railway is forced to cease operation because of competition and too low a fare. The novelty of the motor-driven vehicle and the desire to have the latest mode of transportation has led to the tendency in many cities to refuse an increase in fares to the railway, but to permit competitive bus service, even at a higher rate than that asked by the car company. The service given by the trackless routes has been by "jitneys" and individually owned buses. This was the case in Saginaw, and while there was not a true test of organized bus transportation, nevertheless the two years of suspended car operation should have been ample in which to organize and demonstrate the feasibility of the bus for a city of that size.

The difficulty in Saginaw, as well as elsewhere, was that the city administration insisted upon a rate of fare so low that no responsible bus interests would undertake the service. It made a good political issue to do this. But when the people got tired of keeping the problem in politics, the public officials not only found that they would have to permit a fare higher than 5 cents, but that they could make a better bargain with the railway company than with any one else. In fact, it was the only way they could be sure the people of Saginaw would have adequate and dependable transportation. With politics displaced by common sense, the people readily approved the franchise and are now enjoying the benefits of a modern car-bus system conducted on the most economical basis.

## "Personalize"

IN THE business world in general there has been no satisfactory substitute for personal contact, and the utility business is no exception. Elimination of the popular concept of the "soulless" corporation is one of the important results which may be accomplished.

In this connection it is gratifying to note the spirit that was manifested during the recent joint meeting of the Illinois railway, gas and electric associations in Chicago. The organization of a speaker's bureau to qualify employees for carrying the facts regarding the utility business directly to the people was indeed a long step in advance, and one which, if properly applied, has far reaching possibilities.

The word "personalize" aptly defines the desired objective; personalized relations between the management and employees on the one hand, and personalized contact between the utilities and the public, on the other. Adding this thought to the phrase used by the JOURNAL to express Mr. Budd's ideas as set forth in an interview with him last December rounds out an inspiring slogan:

*"Modernize, Merchandize and Personalize"*

## Cleveland Railway Can Do It Best

BUSES have been proposed for use in Cleveland. One set of interests appears to be demanding certain rights whether or not the Cleveland Railway is willing to go into the bus business. Another set has gone on public record as desiring rights only if the local railway is unwilling or unprepared to operate buses. As for the railway, its position is quite clear. President Stanley has said that if the city craves buses the railway should be allowed to operate them.

One thing is certain. Buses can be expected to operate in Cleveland only at a fare which will insure a profit to the operators. In fact, the proposal of the People's Motor Bus Company contains a provision for a 10-cent fare. The apparent excuse behind this request is that a parlor car service—something between that supplied by the taxicab and the street car—will be furnished, and that largely for this reason the service will not compete with that of the railway. As a theory, part of that is all right, but in the case of the Cleveland Railway, under the present service-at-cost grant, the cost in fares to patrons would be only 6 per cent on the value of the capital required to be put into the system. Thus if the Cleveland Railway operated buses at a 10-cent fare and showed a profit, the excess over 6 per cent could be turned back to benefit the street car rider. Of course, some will ask why the bus rider should pay anything toward the cost of the ride on the railway. In a combined transportation system, the same answer applies to this question as to why the rider on a profitable car line should have to help to pay the deficit on the unprofitable lines.

Entirely aside from the question of whether the bus would serve a real public need in Cleveland the position of the railway is a sound one. The Cleveland Railway has functioned uniformly well in the interest of the public. There is no good reason why it should not do so indefinitely. If Cleveland wants to have buses the best way is to turn the bus operating rights over to the Cleveland Railway as this will make certain that the city will continue to secure in full the transportation benefits which it now enjoys. The greatest benefit of the bus will unquestionably come when it is operated by the same organization as the railway, so that it can be made to extend and amplify the service of the rail lines without the competitive results, if operated separately, which injure the prospects of both systems.

## Interurbans' View of Billboards

THE announcement made a few days ago by the Standard Oil Company that it intended to discontinue the practice of billboard advertising where such signs deface attractive scenery is welcome news. Other large manufacturers have agreed to do the same. While the immediate object of this plan is to render the highways more attractive to automobilists, perhaps this program of removal will eventually extend to routes of the interurban railways and steam railroads. At present the unsightly billboards lining the tracks in many places are a source of annoyance and displeasure to passengers.

Advertising is a good thing in its place, but, like many good things, it can be done in the wrong way. Every manufacturer has a story to tell the public, and his prosperity depends to some extent upon the skill used in telling it. It is doubtful, however, whether advertising on a billboard located where it mars the beauty of a picturesque spot really promotes sales. A better place to advertise is in the advertising racks of electric railway cars and in stations, making use of the attractive cards that often display real art as well as present a selling appeal. Such advertising is not a transgression upon any one's outlook. As with newspaper and magazine advertising, it comes to the reader when he is in a receptive mood to receive information, and thus serve a useful purpose. But billboard advertising along the highways and railways is displeasing to many, and it sometimes constitutes an accident hazard as it cuts off a clear view.

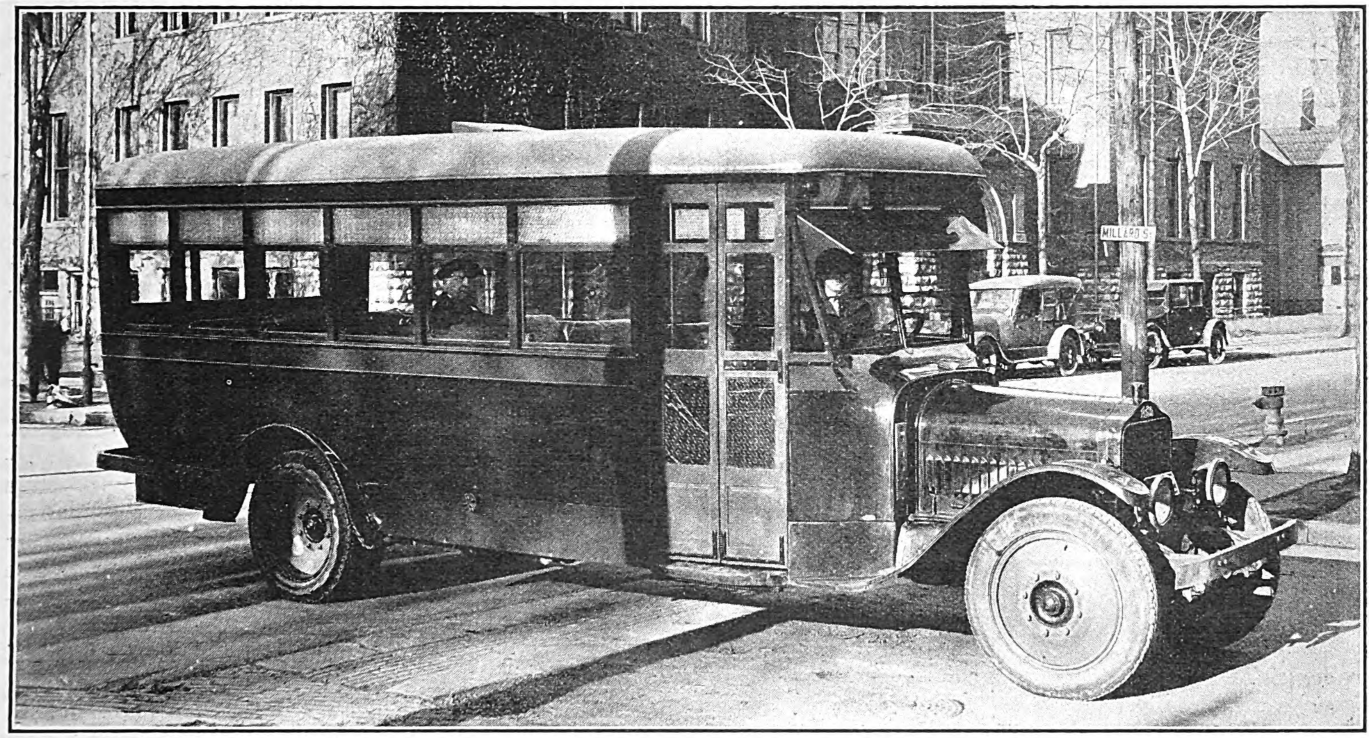
## If It's Worth a Picture, Make It a Real One

THESE days the electric railway industry is making use, as never before, of window posters, cards in the advertising racks and pamphlets for distribution to passengers. To brighten up the appearance of such publicity material, many companies have introduced pictures of their cars and other equipment. In so doing, some have had the good judgment to make the pictures accurate and lifelike, while others have carelessly presented unreal objects and labeled them cars, or whatever they were intended to represent.

If it is worth while to use a picture at all in publicity work, it is worth while to make it a real picture of the desired object. It is almost always a mistake to think, "The public doesn't know anything about that. People will never notice the difference." The public has hundreds of thousands of eyes, and includes many persons trained to accurate observation. Such people at once notice any inaccuracy in the railway company's advertising. There are also a great many people who perhaps do not know why a picture impresses them unfavorably, but who somehow subconsciously recognize that it is not as it should be. It is quite worth the cost to have a professional photographer take the pictures needed for publicity matter. The railway equipment will then be shown as it really is.

In addition, a rush-hour route known as the Sheridan-Annesley line was recently established to carry the workers in the mills of South Saginaw between the factories and their homes in east and southeast portions of the city. Several empty buses are waiting at the factories at quitting time to carry the workers homeward, while a like number of buses leave the northern terminal of the route on definitely scheduled time in the morning to transport the men to work. Very little transferring is done between these buses and the two or three car lines crossed en route, as the direct route of the buses serves the full needs of the riders.

During the month of February, 1924, a total of 861,210 revenue passengers and 161,522 transfer passengers were carried by the combined system. Of this number, 577,029 revenue passengers and 102,346 transfer passengers were carried by the street cars, while 284,181 revenue passengers and 59,176 transfer passengers were carried by the buses. These figures indicate that with 16 scheduled buses during the day and 25 in the rush hours, the bus system is carrying nearly one-half as many passengers as the car system with a schedule of 26 cars during the non-rush hours and 40 in the peak hours. From this it appears that each bus is carrying about four-fifths as many revenue passengers as each street car. Standees are allowed on both systems.



Twenty-five-Passenger, Street Car Type White Bus, Used on Car-Bus System of Saginaw

Headways on both rail and bus routes vary from 6 to 10 min. during the day, and schedules have been so arranged that connections are made between buses and cars at the terminals and intersections of routes. Service has been further improved by staggering the cars and buses along the streets traversed by both. Free transfer is given between the buses and cars, and the fare of 10 cents cash or four tickets for 25 cents is the rate on both.

### MAINTENANCE

Maintenance of the vehicles, both cars and buses, is done on a mileage basis. Inspection, however, is given to each piece of equipment at least once a day. In this co-ordinated system, the bus is as important a factor as the car; therefore, enough vehicles have been provided to meet the heavy rush-hour service. During the day only 16 buses are operated, leaving nine in the garage for inspection, cleaning and repairs.

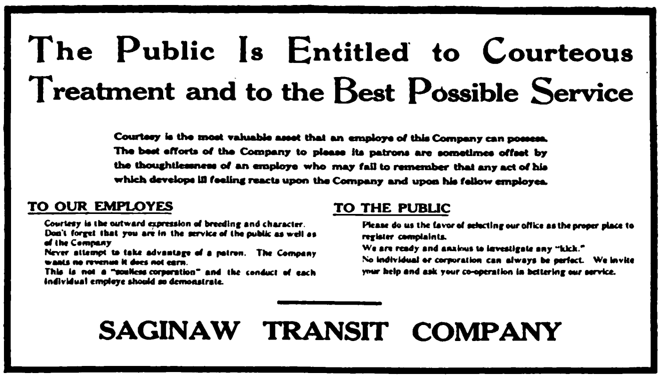
Provision has been made in a section of the old carhouse for the storing and maintaining of the buses. This garage is approximately 50 ft. wide by 200 ft. long. The rails have been left in place and the floor level brought up to the face of the rail by filling in with cinders. A portion at the rear has been covered with a concrete floor and is used for inspection and repair purposes, the forward section serving as a storage area only. In an adjoining bay a wash rack has been provided where the buses are washed inside and out once a day. A battery-charging outfit occupies one corner of the garage at the rear, while a 50-ton wheel press is mounted in the opposite corner.

All maintenance work with the exception of tire repairs will be undertaken by the company in this garage and the railway machine shop. It was found advisable to have a local vulcanizing repair shop do all the tire work, which includes removing the tire from the wheel, vulcanizing and replacing the tire. During the three months of operation this work has amounted to approximately $40 per month. If the company had undertaken this work the cost to it would have been approximately $150 per month. An extra White and an extra Reo engine have been purchased and are kept in the storeroom, with a complete set of replacement parts for the Whites. This was not necessary with the Reos because of the adequate stock maintained by the local dealer.

When difficulty is encountered on the road by any of the buses, the driver immediately calls the garage. The garage foreman sends out the service truck and a replacement bus. The driver has been instructed to make no attempt to repair the bus he is driving, but to continue if possible to the terminal of his route, where he will take the replacement bus and continue his trip. If it is merely tire trouble, the crew on the service truck will make the change. If it is some minor mechanical defect correction is made on the road, but if the trouble is found to be serious, the vehicle is towed to the garage. In any of these three cases, the bus is returned to the garage, where it is repaired and stored until needed.

### AMPLE GASOLINE CAPACITY PROVIDED

Gasoline and oil records are very accurately kept by checking the quantities used against the speedometer mileage reading. To eliminate the necessity of purchasing gasoline on the road, the gasoline carrying capacity of the buses was increased. The 25-gal. tank on the Reo cars was replaced by a 35-gal. tank, and the tank on the White buses has been augmented by an auxiliary 16-gal. tank. These capacities make it unnecessary to replenish gasoline during an entire day's run. Two 8,000-gal. storage tanks have been buried in the ground adjacent to the garage and supply the vehicles with fuel through the customary measuring pump. The oil supply is maintained in drums and is furnished to the vehicles in small quantities whenever necessary. However, a complete change of oil is made every 500 miles. Plans are being formulated for burning the old oil under the boiler used for heating the carhouse and garage.



**The Public Is Entitled to Courteous Treatment and to the Best Possible Service**

Courtesy is the most valuable asset that an employe of this Company can possess. The best efforts of the Company to please its patrons are sometimes offset by the thoughtlessness of an employe who may fail to remember that any act of his which develops ill feeling reacts upon the Company and upon his fellow employes.

**TO OUR EMPLOYES**

Courtesy is the outward expression of breeding and character.
Don't forget that you are in the service of the public as well as of the Company
Never attempt to take advantage of a patron. The Company wants no revenue it does not earn.
This is not a "soulless corporation" and the conduct of each individual employe should so demonstrate.

**TO THE PUBLIC**

Please do us the favor of selecting our office as the proper place to register complaints.
We are ready and anxious to investigate any "kick."
No individual or corporation can always be perfect. We invite your help and ask your co-operation in bettering our service.

**SAGINAW TRANSIT COMPANY**

Sample Window Poster Being Used in Cars and Buses to Set Forth Policies of New Company

Before starting on his run, each operator is supplied with $10 worth of tokens. He furnishes his own change. All fares are collected by means of a Johnson fare box. An operator's trip sheet is used to record the fare box readings, a space is provided for the opening and closing numbers, and settlement is made to the cashier on the basis of these readings. The register readings on the trip sheet are checked in the general office by means of a statement of register readings taken by a barn man during the time the vehicles are in the barns. This reading is entirely separate and independent of the readings taken by the car and bus operators.

The classification for bus accounting, tentatively adopted by the American Electric Railway Accountants' Association, is used. For the first three months of operation, the figures showed the operating expense to be 14½ cents per revenue bus-mile, exclusive of taxes, interest and depreciation. Depreciation on the buses has been figured at 33⅓ per cent, which makes the total life of the bus approximate 250,000 miles.

Keeping the public sold on its own transportation system has been the aim of the management in speeches given before local business organizations at noon-day luncheons. "Leave your car home" is the theme of these talks and of the advertisements run in the local papers. It is pointed out to the local merchant and business man that they are losing money on the space at the curb in front of their establishments if such space is used for parking purposes. Formerly, less than 25 per cent of the merchants left their cars home, but now more than 45 per cent do so, and in that way provide a convenient loading zone for their customers. Interesting figures from local retail merchants show an increase of 20 per cent in sales, while those who are located near the transfer corner report an increase in sales of 30 per cent since the movement was started.

Parking has been changed from a position of 45 deg. to the curb to a parallel position, and time limits have been strictly enforced. All streets upon which routes of the traction company operate have been made "stop streets." This has done much to eliminate collisions between private automobiles and the cars and buses of the company.

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# Concrete Poles Used Because of Ornamental Appearance

### Although More Costly than Steel or Wood Poles, They Are Used by the Municipal Railway of San Francisco Because They Are More Sightly and Permanent

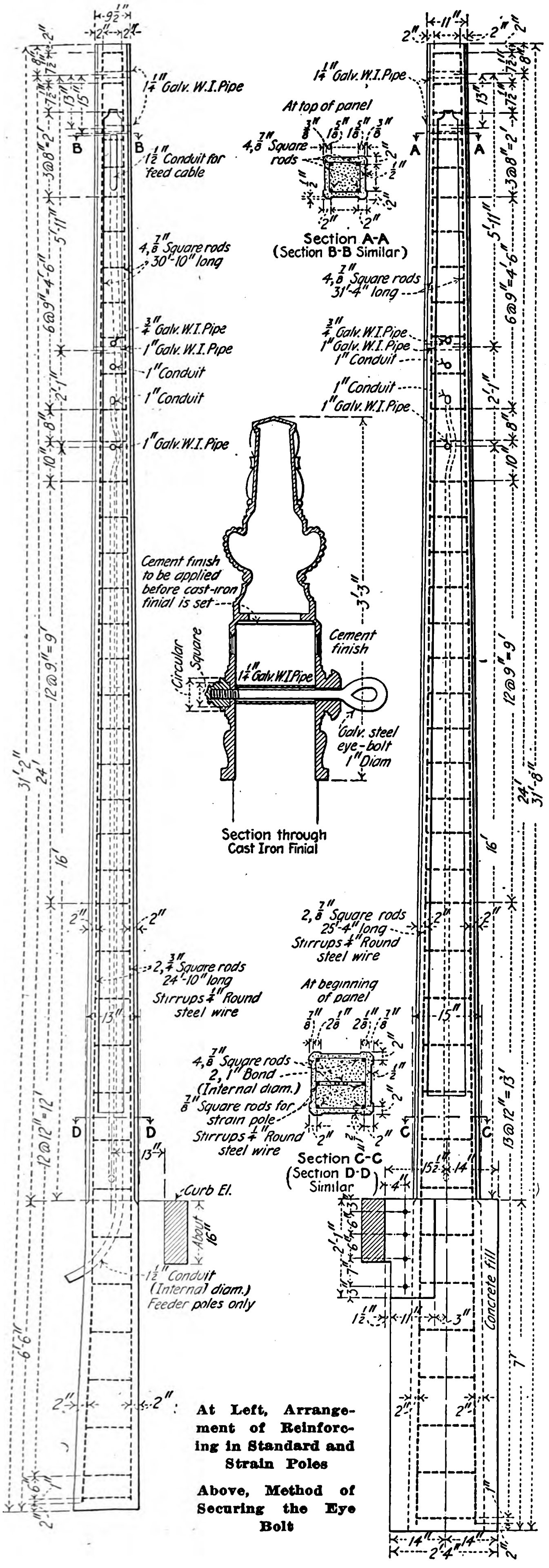
FOR a number of years the Municipal Railway of San Francisco has been using concrete poles to support its overhead construction. Various types have been tried, and although concrete poles are more expensive than steel poles in first cost they are favored by the railway on account of their ornamental appearance and because they require comparatively little maintenance once they are installed.

Forms for the poles are built as a series of horizontal troughs in which the poles are cast. The top surface is given a float finish. The poles are then covered with wet sand and are sprinkled with water every day. Wooden forms are very thoroughly wetted, particularly in the case of panel poles, so that the swelling of the wood will not crack off the corners of the pole along the edge of the panel. After the poles have been erected and finished, all exposed surfaces are painted with two coats of "Concreto" as manufactured by the Muralo Company, or some other equivalent concrete paint, of whatever color may be desired.

A concrete mixture in the proportions of 1-2-4 is used. The cement is carefully tested. At least 92 per cent by weight must pass through a sieve of 10,000 meshes to the square inch, and at least 77 per cent must pass through a sieve 40,000 meshes to the square inch.

Briquettes made from neat cement, after being kept one day in moist air and the remainder of the time in water, must develop a tensile strength per square inch as follows: After seven days 500 lb. and after twenty-eight days 600 lb. Briquettes made with one part cement and three parts sand and exposed in the same way in the neat tests must develop a strength of 200 lb. after seven days, and 300 lb. after twenty-eight days.

Pats of neat cement about 3 in. in diameter and ½ in. thick at the center, tapering to a thin edge, being kept in moist air at normal temperature for twenty-

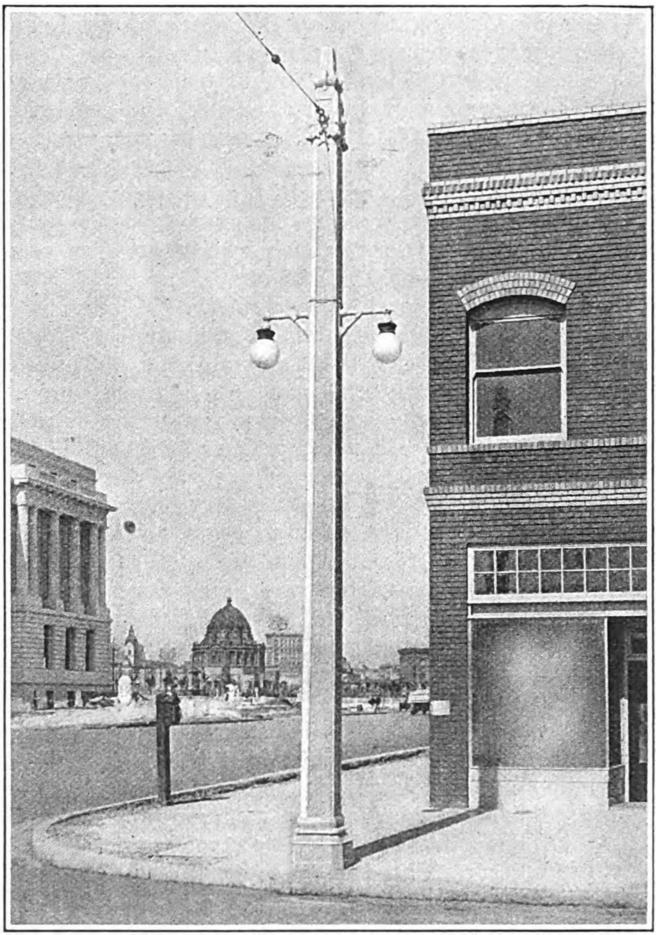

1¼" Galv. W.I. Pipe
1½" Conduit for feed cable
4, ⅞" Square rods 30'-10" long
¾" Galv. W.I. Pipe
1" Galv. W.I. Pipe
1" Conduit
1" Conduit
1" Galv. W.I. Pipe
At top of panel
4, ⅞" Square rods
Section A-A (Section B-B Similar)
4, ⅞" Square rods 31'-4" long
Cement finish to be applied before cast-iron finial is set
Cement finish
Circular
Square
1¼" Galv. W.I. Pipe
Galv. steel eye-bolt 1" Diam
Section through Cast Iron Finial
2, ¾" Square rods 24'-10" long
Stirrups ¼" Round steel wire
2, ⅞" Square rods 25'-4" long
Stirrups ¼" Round steel wire
At beginning of panel
4, ⅞" Square rods
2, 1" Bond (Internal diam.)
⅞" Square rods for strain pole
Stirrups ¼" Round steel wire
Section C-C (Section D-D Similar)
Curb El.
About 16"
1½" Conduit (Internal diam.) Feeder poles only
Concrete fill
A
B
C
D
31'-2"
24'
31'-8"
16'
12@9"=9'
13@12"=13'
6@9"=4'-6"
3@8"=2'
5'-11"
2'-1"
6'-6"
7'
2'-4"
14"
15"
13"
11"

**At Left, Arrangement of Reinforcing in Standard and Strain Poles**

**Above, Method of Securing the Eye Bolt**

four hours and then placed in water and raised to a temperature of 212 deg. F. in one hour and maintained at such temperature for five hours, and other pats kept, one in the open air and one in water, at a temperature of about 65 deg. F. for twenty-eight days must show no signs of distortion, blotching, cracking or disintegration.

Poles are erected by means of a movable derrick with sling. No special tests have been made of their strength, but those in service are satisfactorily carrying a load of 800 lb. at the eyebolt. Besides sustaining their legitimate load, concrete poles have stood up well in many automobile collisions. However, these poles are very heavy, weighing approximately 150 lb. per cubic foot and the railway has found that great care must be exercised in placing them in order to avoid setting up excessive stresses before they reach an upright position.



**Type of Concrete Pole Used by Municipal Railway of San Francisco**

To increase the ornamental effect created by the concrete poles, a cast iron base is used. This was originally cast in one piece and was slipped over the top of the pole at the time of erection. Later, however, in order to facilitate the replacement of broken castings, these bases were made in two parts and bolted together. An ornate lighting fixture is placed on the upper part as these poles serve a combination purpose. In the accompanying illustration of a pole on Van Ness Avenue a temporary lighting fixture has been installed. Cast iron lamp brackets of a more elaborate design will eventually replace this temporary system. In 1918 the contract price for poles used by the Municipal Railway was $92 each for the standard poles and $110 each for the strain poles.

# Twin City Starts Thrift Fund

### Rapid Transit Company's Plan for Encouraging Savings Nearing Completion of First Year —Men Get Increased Life Insurance Besides 4½ per Cent Interest

TO ENCOURAGE its employees to save money, the Twin City Rapid Transit Company on April 1, 1923, introduced a thrift plan, and offered to give a life insurance policy to each employee who would begin and continue saving a part of his wages according to the plan. The amount of the life insurance policy thus offered varies with the length of service of the employee and his period of saving. Insurance policies in the sum of $500 are taken out by the company for all of its employees who have been in the service for six months or longer. This amount of policy is increased to $1,000 during the first year of saving to all employees who join the thrift fund and have been with the company for five years or less. It is increased to $1,100 if the employee has been with the company for six years, and to higher amounts by gradations up to the maximum of $2,000 for the man who has twenty years of service when he entered the thrift fund.

There is also a gradual increase in the amount of the principal of policy (up to the maximum of $2,000) with the length of time that the employee continues in the thrift plan. Thus, the man with one year or less of service in the company must continue his saving for five years to increase his policy from $1,000 to $1,100. Then it grows by $100 each year until the maximum of $2,000 is reached. The older man gains this maximum sooner. Thus, the man with ten years service reaches the $2,000 mark after only five years of savings, and the eighteen-year man after only three years of savings. The insurance is in addition to the death benefits.

The amount of saving required under the plan is 2 per cent of the wages of the employee, this amount to be deducted from the portion of his wages payable on the 25th of each month. The deduction from his wages for his dues in the benevolent association is made from the portion of his wages payable on the 10th of the month. The amounts for the savings fund thus obtained are deposited in one of the strongest local banks and draw interest at 4½ per cent, compounded semi-annually.

If any portion of the principal or interest is withdrawn by the employee during the first five years (except under conditions described below) his insurance automatically drops to $500, but after the fifth year his insurance policy remains at the point at which it reached when the deposits were withdrawn. Employees of sixteen years of service and more have to continue their savings for only one year to secure the same benefits. Employees placed on the pension roll are exempted from obligations to make future savings and may withdraw their savings without decreasing the face value of their policies. Exemption is also allowed to those who desire to apply their savings to the purchase of homes, as they may withdraw their deposits for that purpose without forfeiting any of their insurance. The case of special emergencies is taken care of by allowing an employee at any time to borrow from the company up to 90 per cent of the amount of his deposit, but he must pay 5 per cent on the loan, and it must be repaid in ten months after being contracted by deductions semi-monthly from the employees' wages. The purpose of charging ½ per cent more interest than that paid by the bank is to discourage applications for loans on the basis of the deposits.

Employees who leave the service have the privilege of leaving their deposits in the same bank, but in that case they will draw only 4 per cent instead of 4½. Employees leaving the service also have the privilege of continuing their life insurance policies without medical examination for the same amounts in any of the forms of policy customarily issued by the insurance company, except term insurance, and thereafter pay the premiums direct to the insurance company determined by the age at the time of leaving the service, but application to do so must be made within a certain time. In this way it is impossible for the employee to lose his life insurance after leaving the service because of inability to pass the examination. Various provisions are contained in the thrift plan to cover conditions of sickness, etc.

The plan has met popular approval on the part of the employees, and the aggregate savings under it from April 1, 1923, up to the middle of February, 1924, amounted to about $115,000.

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## The Car Riders Make the Pay Check Possible

A PUBLICITY slip distributed by the Olean, Bradford & Salamanca Railway, Olean, N. Y., was described in ELECTRIC RAILWAY JOURNAL for March 22, page 472. These slips are attached to all outgoing checks and are used to supplement a publicity campaign in the local newspapers. A line of type was omitted in the story referred to and the wording of these slips was on that account improperly given. The slip itself is reproduced below:

> *It Is the People*
> *Who Ride on Our Cars That Make*
> *This Check Possible*

## Red Call Lights Summon Inspectors

THE dispatcher at the carhouse of the Holyoke Street Railway keeps in close touch with his inspectors on the road by means of a system of call lights. Nine red electric lights are located at strategic points along the lines of the railway. To correspond with these there are also nine lights on the wall of the dispatcher's office and nine snap switches close at hand. By a turn of the wrist he lights simultaneously one of the lights on his office wall and a light located on a pole out on the system.

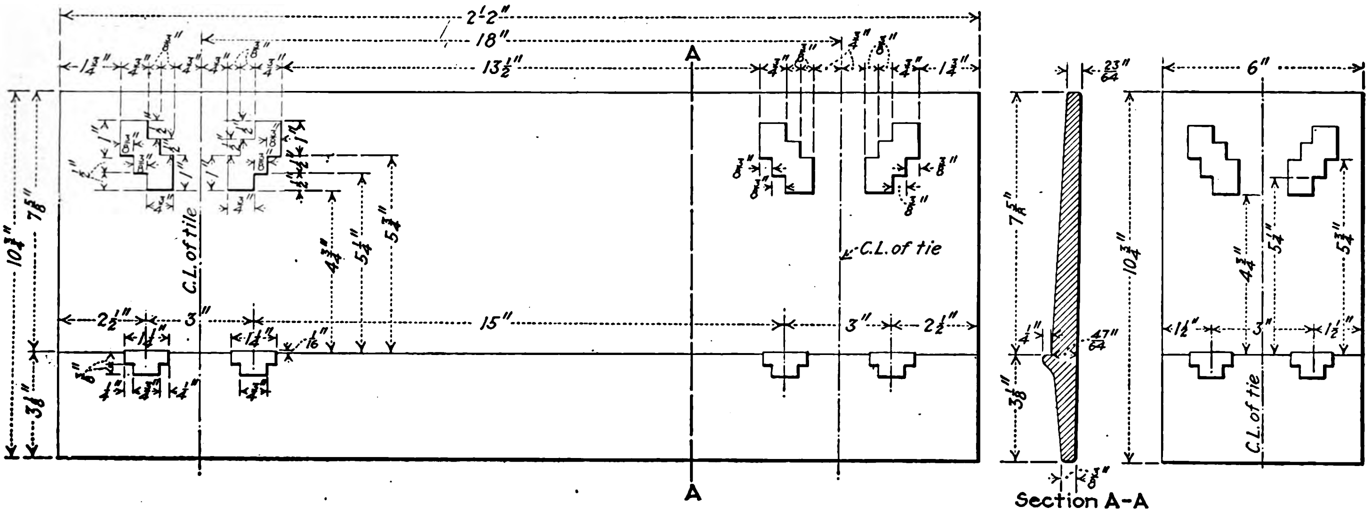
On the same pole as the red light there is also a telephone communicating with the dispatcher's office. As soon as any inspector sees the red light he immediately calls up the dispatcher. The particular advantage of this scheme lies in the fact that the red light can be seen for a much greater distance than the ringing of a telephone bell could be heard. As soon as an answer has been received from the point with which the dispatcher wishes to communicate he turns off the light again. In case no inspector answers the telephone and the red light continues to burn the car crews are instructed to telephone in before passing the point. This system enables the Holyoke Street Railway to reroute its cars in an emergency and delays have been avoided.

# Rail Welding in Connecticut

### An Especially Interesting Feature of the Connecticut Company's Track Is the Tilted Joint Plate and Base Plate, Adapted to Twenty-three Different Rail Sections—Precautions Adopted to Secure Good Welds

ALTHOUGH rail welding with the electric arc has been practiced on a commercial scale for more than a decade, it is only within the last few years that the subject has received the intensive study which it deserves. As it was a comparatively new field of endeavor, a great deal of individual experience had to be gained before those interested in rail welding could meet and discuss intelligently its problems. But out of the methods adopted and the results secured during the first years and through the war period, the principles of rail welding may now be regarded as more or less established.

The experience of the Connecticut Company in electric arc welding has undoubtedly been that of hundreds of others. Commencing in 1914 with the resistance type of arc welder using metal electrodes, the work was confined to the surface welding of cupped rail joints. During the war the delivery of rail was curtailed. This condition required the purchase of additional welders to maintain track, and for the most part these welders were of the motor-generator type and capable of using both metal and carbon electrodes.



Standard Base Plate, on Left, and Tie Plate, on Right, Used Under Tee Rail by the Connecticut Company. These Plates Fit a Large Number of Rail Sections

The first carbon welding by the Connecticut Company was done on joint splices in old rail, which had to be left in place when the street was paved. Obviously the combination of old rail, high carbon rolled plates, new welding machines and methods with which the operators were unaccustomed could hardly be expected to give a very high-class product. Nevertheless, much creditable work was done at this time, and the object of "tiding over" the war period was attained. With the resumption of easy deliveries of rail after the war, the use of the arc weld for rail joints received added impetus.

For many years the Connecticut Company has standardized for new work on three rail sections for its 805 miles of track owned and operated, and its 33 miles of track in and around carhouses. These standards are: The A.E.R.A. standard 5-in. 80-lb. A.S.C.E. tee, the 6-in. 100-lb. A.R.A. type "A" tee, and the A.E.R.A. 9-in. 134-lb. grooved girder. In the old track of the company, however, there are still to be found many varieties of rail sections, amounting to 150 in number. An account will be given of some of the improvements in the carbon arc welded rail joints adopted by the Connecticut Company, which it is thought will prove of interest.

## JOINT PLATES AND BASE PLATES

For the old rolled joint plates, there have been substituted machined plates with a lower carbon content. This change has resulted not only in a vastly improved fit between the plate and rail, but in greatly improving the conditions for joint welding. This change was a big step in the improvement of the joint and weld.

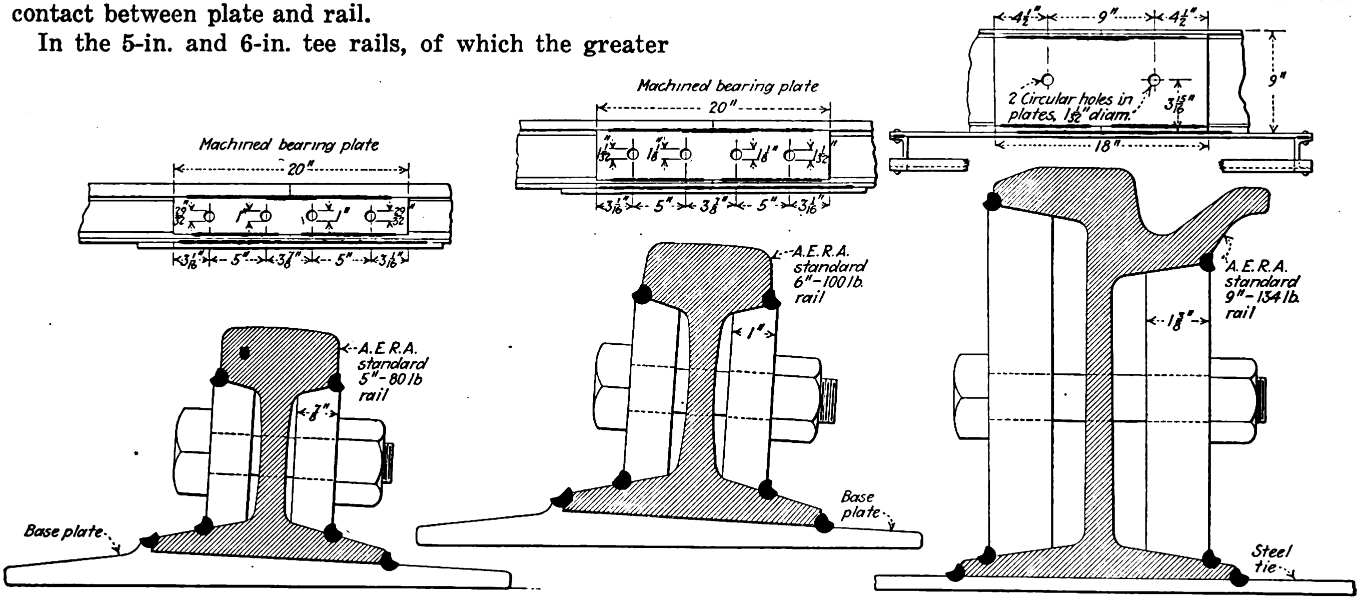
The adoption at each joint in tee rail construction, of which the company has a large amount in paved street, of the base plate illustrated in the first drawing has also proved a definite step in increasing the strength of joint. The base of the rail in paved construction is seam-welded to this base plate. The tilted feature, which cants the rail inward to an inclination of 1 in 20, to increase the area of wheel contact on the rail and transmit the load symmetrically and directly over the center line of the web has been followed on the Connecticut company's lines for some years. Between joints the inclination of the rail is carried through by the use of intermediate tie plates of the same cross-section as the joint base plate, as shown in the drawing on this page. A feature of each of these plates is the staggered notching of the spike holes. This permits these plates to be used with twenty-three different rail sections, and the arrangement of the holes obviate the necessity for rights and lefts being kept in stock.

In the case of the 9-in. grooved rail, laid on steel ties, the steel tie becomes the base plate, and the rail is welded to it in the same way as to the base plate, just described. As the steel tie is also welded to the opposite rail, the track is cross-bonded, rail to rail, at every joint, thus greatly improving the track return.

### BOLTS IN GIRDER JOINT REDUCED TO TWO

In the 9-in. girder section illustrated, the number of holes required by the old bolted channel bars was twelve, in addition to four holes necessary for two concealed bonds. This made sixteen holes in all in each joint. In the new joint one hole in each rail has been found sufficient, provided two high-tension bolts are used and if the plate is of sufficient stiffness to overcome any chance of bending.

The welded seam furnishes the bond. In this big reduction in the number of holes, it is felt that another great improvement in the strength of the rail end has been made. The increased thickness of the plate provides a welding shelf for the top seam and also admits of a shorter plate without any reduction in the area in contact between plate and rail.



The Three Standard Rails of the Connecticut Company, Showing Location of Joint Welding Seams

In the 5-in. and 6-in. tee rails, of which the greater mileage will be constructed, the company's standard joint drilling has been retained to permit the use of this type of joint in existing track if necessary. The size and shape of the holes in the plates, however, have been changed. The old slotted hole inherited from steam road practice, while necessary in open track to provide for considerable expansion and contraction, has been discarded in favor of the round hole where the track is to be embedded in pavement and so not subjected to a great range of temperature fluctuation.

The object sought in the welded joint is to arrest entirely any longitudinal motion in the individual rails. When these joints are bolted up, the two outer bolts are first installed, requiring the rail ends to be tightly butted together. Machine bolts $\frac{1}{32}$ in. smaller than the hole are used. This size has been found to give a good tight fit in actual practice. In fact, in some cases, it has been necessary to ream the hole to get the bolt in. The two inner holes are made $\frac{1}{8}$ in. greater in diameter than the bolt to admit of easy entrance and to speed up the work.

### METHOD FOLLOWED IN WELDING

Before a start is made to weld the seams, it has been found desirable to look first over the alignment of the joint in the track. This is particularly important on curves, since the order in which the seams are made can improve or upset the alignment. The first seam made has a tendency to push the rail away from the operator and change the alignment.

Of equal importance is the grade or vertical elevation of the joint, which should be checked up with a 3-ft. straight-edge before being welded. In the manufacture of rail there is a tendency for the rail end to drop, so that if this is found to be the case, the welding of the base seam first will have a beneficial effect in tending to raise the end of the rail slightly.

The location of the first seam to be welded is then preheated by passing a long carbon arc for a few seconds over it. The seams are then made with the carbon arc, using the "hand-fed" steel method, which has now supplanted the "laid in" method. The depth of the seam is such that it is at its deepest at the middle of the seam, tapering off at the ends to avoid undesirable craters. Close attention is also given to staggering all seams, top with bottom and side with side, including those on the base plates. This tapering and staggering and the other methods mentioned later are important factors in eliminating entirely broken rails due to crater notches. It is the practice on the Connecticut Company also to weld a second time for a few inches in the middle of the top seams, and correspondingly to break off for a few inches in the middle of the bottom plate seam. The completion of each seam weld is followed by post-heating with the long carbon arc, in the same manner as in preheating.

### HOW CONTRACTION STRAINS ARE AVOIDED

For some time it has been recognized that the welding of rail joints sets up a considerable contraction strain in the track as a whole, due to the work being done in warm weather. When the rail is at its maximum expansion, if the contraction strains are not guarded against and there is a drop in temperature on construction work which includes special trackwork within its limits, damage to the special trackwork is apt to occur if the welded joints and rail prove to be the stronger. To guard against this contingency, it is the practice of the Connecticut Company to leave the joint unwelded and the bolts tight in one end of the plate only where the welded track meets special work, even though it is to be paved up. Then this open joint is filled in

# Association News & Discussions

## Optimism Features Illinois Utility Meeting

### Improvement in Spirit Attributed to Co-operative Effort—New Speaker's Bureau to Tell Utility Story in Local Talks Throughout the State—Railway Men Discuss Publicity, New Cars, Bus Operation and Track Construction

IN CONTRAST with similar meetings of only a very few years ago, the joint meeting of the Illinois gas, electric and electric railway associations, held at the Hotel Sherman in Chicago on March 26 and 27, was marked by a very obvious spirit of optimism. A record attendance at all of the meetings, a full program of timely and constructive papers, accompanied by animated discussions and favorable reports of relations with the public in various locations, were some of the outward evidences of the present spirit.

B. J. Mullaney, chairman at the dinner on Wednesday evening, called attention to the change which has occurred in the utility viewpoint during the past five years. "The atmosphere of this meeting," he said, "is marked by a total absence of that tendency to cry about our troubles which tinged some of our comparatively recent past meetings." Contrasting the present conditions with those of only five years ago, he attributed the improvement to the birth of a new spirit of co-operation among the utilities themselves and to a determination on their part to face their difficulties with a united, constructive effort. Success in telling the utility story to the public, he named as one of the primary reasons for the improved conditions.

Reports from the chairmen of each of the ten pulbic service speaker's bureau districts into which the state has been divided indicated considerable progress in the work of organizing the utility men in each district and in the compilation of lists of schools, civic, business and social organizations to be addressed by speakers working under the direction of the bureau. As outlined by the various district chairmen, this new activity has been given a favorable reception in those instances where talks have been given. It was reported that the people of the state seem to be genuinely interested in the information which the utilities have to impart.

Selection and development of employees to make simple talks outlining facts about utility business was considered an important part of the local committee activity. Posting all employees on such facts relative to their business as would enable them to answer questions in their daily contact with friends and customers was also held to be an important phase of the work.

Mr. Mullaney pointed out the importance of co-ordinating this new local activity with the work of the Illinois Committee on Public Utility Information, and explained that the publicity work of that committee as carried on through the newspapers and schools is of very material importance in arousing public interest in utility affairs and in making local audiences receptive and ready to hear the story told by the speaker's bureau representatives.

### RAILWAY MEETINGS IN AFTERNOON

Both morning sessions were joint sessions, devoted to the general interests of the three associations. In the afternoons each association met separately for the presentation and discussion of technical papers.

The Wednesday afternoon session of the Railway Association was taken up by the presentation and discussion of papers on "Educating the Public," by Luke Grant, and on "Education of the Employees of the North Shore Line," by C. G. Goodsell. These two papers are abstracted elsewhere in this issue, along with a written discussion by W. H. Sawyer, which in the absence of Mr. Sawyer was read by Mr. Mitchell, East St. Louis, Ill.

J. R. Blackhall, general manager Chicago & Joliet Electric Railway, commended the publicity and educational work of the North Shore Line and stated that the industry owed a debt of gratitude to the management for the outstanding example which this property has furnished of the results which can be accomplished through properly planned and directed work of this kind. Mr. Blackhall was in entire accord with the idea of giving service first and then following with proper publicity. The resources of the small property do not allow the degree of specialization which can be carried out in the organization of the larger properties, and for that reason, according to Mr. Blackhall, the duties incident to publicity and educational work must be shouldered by the officers on the small property.

From the standpoint of the results which can be accomplished, he said that this difficulty is more than offset by the close contact between the management and its men on the one hand and between the management and the community served on the other. He maintained that the most important requirement for success is a proper appreciation by the small property manager of the results which can be accomplished by proper cultivation of the right kind of contact with both the community and the men of the property.

Prompt attention to complaints, which generally require only small expenditures for removal of the cause, were cited as a method of obtaining big returns in the form of a friendly public attitude. Settlement of damage claims whenever this is possible, in place of litigation, was mentioned as another effective method of inspiring good will.

Mr. Blackhall indorsed the speaker's bureau work and stated that in his opinion the majority of the public is essentially fair, and if the local utility has done its part in rendering the best service possible under given conditions the public is willing to listen to the utility side of the story. He said that the proper kind of publicity, particularly that prepared by the committee on public utility information, has helped a great deal in obtaining increased rates and in pointing out to the public the effects of automobile competition on railway service. He showed how proper activity by utility managers has put this industry among the leading industries of the community, fast resulting in utility men being given a leading place and taking a leading part in the activities of community civic organizations—Kiwanis, Rotary and similar clubs.

### EXECUTIVES HAVE REQUIRED EDUCATING

F. E. Fisher indorsed Mr. Sawyer's views that it has frequently been the railway executives who required the educating as much if not more so than the public.

D. E. Parsons stated that personal contact with complainants was a successful method of making friends. He said that by getting in touch with the author of a complaint, either in the company's office or through a personal call, a friendly spirit of co-operation can be engendered which in most cases makes a booster for the company.

W. S. Vivian discussed the employee educational work which is being carried on by the Midwest Utilities Company, and also cited examples of previous work which he had done in training inexperienced employees to speak before large audiences. Not only does this kind of work accomplish very satisfactory results from the standpoint of "getting the story over," according to Mr. Vivian, but it soon receives the very enthusiastic support of the employees themselves, who become keenly interested.

To illustrate the extent to which public utility managements have become educated on the need for proper contact with their public, Mr. Grant cited examples from his experience in newspaper work. He said that in some cases he had had difficulty in getting an audience with a utility executive to obtain a confirmation on a commendatory story which had come to a newspaper's attention.

Mr. Bosenbury advocated the Golden Rule as a safe policy in dealing with the public, and T. C. Roderick cited the value of frank statements through paid newspaper space in obtaining sanction of one-man operation in the tri-cities.

At the request of J. P. Barnes, chairman of the committee on co-operation with state and sectional associations, G. W. Welsh discussed briefly the activities of the new committees on city and interurban operation.

### MOTOR BUS OPERATION

A paper by G. T. Seely on motor bus operation, which is abstracted elsewhere, opened the Thursday afternoon session. In the general discussion which ensued motor buses were held to have a place in the field of passenger transportation and to be particularly valuable for handling feeder service and for furnishing extensions to existing lines without the heavy investment required for additional railway construction.

Mr. Parsons advised close watch by railway men of the trucking activities which have followed the completion of hard roads, and stated that co-operation with the truck men would frequently result in inducing them to act as feeders to the railway lines. Mr. Roderick stated that two buses which are now in operation as feeders on the Tri-City property obviated the construction of an extension. These buses, he said, are being charged off on a depreciation basis of 250,000 miles, which at 50,000 miles per year will give an estimated life of five years. Charging the buses with a proportion of the railway overhead, on the basis of mileage, he estimates a total cost per mile of 18 cents.

In reply to a question, Mr. Seely stated that he favored buses of large seating capacity for city service, pointing out that the operating costs are not much greater than for smaller capacity vehicles, and the larger peak load capacity is very desirable.

### LIGHT-WEIGHT CAR CONSTRUCTION

H. H. Adams presented a paper on light-weight car construction, which is abstracted elsewhere. This was illustrated by lantern slides. Mr. Adams amplified his paper by a brief discussion on the automatic doors planned for use on the new Chicago cars. In relieving both the motorman and conductor of the duty of watching out for alighting passengers, these doors, he said, would give the trainmen more time for attention to their other duties and would thus lead to greater accuracy in the collection of fares and increased safety of operation. In addition, he said, the public would be given a favorable impression of improvement and progress by the use of these doors on the new cars.

J. M. Bosenbury pointed out that the problem of a great many interurban properties was to obtain light-weight equipment which would allow a more frequent service and increased speed. For smaller communities he held that the small single-truck type of one-man city car gave satisfactory results.

S. Clay Baker, engineer maintenance of way East St. Louis & Suburban Railway, East St. Louis, Ill., read a paper outlining some problems involved in the construction and maintenance of electric railway track. He said that to his mind "there are many problems confronting the way engineer of the future. With the scarcity and rapidly advancing prices of wooden ties, it seems to point to the use of a substitute which will require the use of concrete to obtain the necessary bearing value. Many properties are realizing the importance of this and are experimenting with the designs now available. Another argument in favor of the solid concrete type is the fact that the surface pavement has a very definite foundation that will withstand the excessive wheel loads of vehicular traffic. To develop the track of the future the principle of the resilient track structure cannot be lost sight of for past experience has led us to believe that this is the important factor in street railway track design.

"Another problem, and one which you now hear discussed by many engineers, is the subject of noise and vibration due to passing cars on a railway track. This is a growing demand of the future, and while it may be alleviated by the type of track structure in use, it may also be influenced by the design of the paving. The various block pavements previously laid with cement grout filler are now being installed with a bitulithic filler with noticeable results. This is especially true on ballasted type of construction where wood ties are used. The reduction of noise and vibration, to my mind, is a refinement of the future and will be taken into consideration in the track designs.

"I also believe it is well to call attention to the progress that has been made during the last few years in the standardization of track materials and the setting forth of recommended practice, thereby eliminating many problems confronting an engineer in determining the most suitable material or design to meet a given condition. This has been especially noticeable in bringing about co-operation with the manufacturers of track and equipment materials. Standard special work layouts may be purchased to meet all traffic conditions. Standard switch pieces, mates, frogs, etc., may be purchased for less than formerly due to the fact that the handling of shop details have been cut to a minimum. In the recommended standard rails there is a section designed to meet any traffic condition and the engineer adopting any one of them will find the particular design entirely suitable to meet his requirements. You can easily see that the way engineers of the future will find it an excellent policy to proceed along lines of recommended practices and thus be able to solve his own problems by the advice and experience of others in the industry perhaps more experienced than himself."

J. B. Tinnon, Joliet, Ill., said that it is frequently a serious problem to find the money with which to take care of needed reconstruction and maintenance of track, but it is most important that a way be found to keep the track in the best possible condition. In each case, he said, the construction adopted is a compromise between the requirements of vehicular and car traffic, and the car design plays a very large part in the results obtained from any type of track. He held that improvements in car design which will remove a part of the present large unsprung loads will do a great deal toward allowing the use of a type of track construction which will give good riding, reduction of vibration and long life.

Mr. Tinnon emphasized the advantages of utilizing standard materials and parts. He also stated that the practice of contracting construction work under proper inspection and supervision would merit serious consideration on many smaller properties where expensive hand labor was being used for such construction due to lack of proper machine equipment.

### NEW OFFICERS ELECTED

The report of the nominating committee was read by D. E. Parsons and resulted in the election of the following officers and executive committee for the ensuing year:

President, R. A. Moore, general manager Aurora, Plainfield & Joliet Railroad; first vice-president, J. F. Egolf, Aurora; second vice-president, C. F. Handshy, Springfield. Directors: W. C. Sparks, Rockford; F. J. McClure, Aurora; D. E. Parsons, East St. Louis; W. A. Baehr, Chicago; A. D. Mackie, Springfield; B. I. Budd, Chicago; J. R. Blackhall, Joliet; W. L. Arnold, Chicago.

At the dinner on Wednesday evening Floyd W. Parsons named customer ownership and consistent advertising as the two most important factors essential to the continued success of the public utilities. He pointed out the close dependence of the prosperity of industry in general on the utilities and painted a mental picture of the outstanding industrial progress which may be expected in the future.

## Slotted Head Screws Standardized

A PAMPHLET giving tentative standard sizes of slotted heads for machine and wood screws has just been published by sub-committee No. 3 of the sectional committee on the standardization of bolt, nut and rivet proportions organized under the procedure of the American Engineering Standards Committee. The committee is anxious to have criticisms of these proposed standards before final drafts are submitted for approval. Copies may be obtained gratis by addressing C. B. Le Page, assistant secretary of standards, American Society of Mechanical Engineers, 20 West Thirty-ninth Street, New York, N. Y.

## Philadelphia Section, A.I.E.E., to Discuss Electrification

RAILROAD electrification will be the subject of the April 14 meeting of the Philadelphia Section, A.I.E.E. The speaker scheduled is H. Van Buren Duer, electrical engineer of the Pennsylvania System. The Philadelphia Section, in anticipation of the large attendance, has engaged the ballroom of the Bellevue-Stratford Hotel for the meeting.

# Light-Weight Double-Truck Car Design*

By H. H. Adams
Superintendent Shops and Equipment Chicago Surface Lines

IN TREATING the subject of light-weight double-truck cars the writer is taking advantage of some recent work along this line upon the Chicago Surface Lines and will confine himself largely to a discussion of the problems considered in developing the design of this group of cars that are about to be built. He desires it understood, however, that in the treatment of the light-weight car he is dealing with conservative design, in which strength has not been sacrificed at any point for the question of weight, and in some cases, where the comfort of passengers is involved, additional weight has been put into the car. Furthermore, in the design an effort has been made to produce a pleasing car, having good lines, which presents an attractive appearance inside and out, as it is believed that such a car is a real asset. This last result in the Chicago Surface Lines car has been accomplished without adding to the weight.

The proposed cars are to be of the double-truck, two-motor, plain arch-roof type, without bulkheads, and provided with pneumatically operated doors on each side of each platform, and so arranged that they may be operated as single units or in trains of two or possibly more cars. On one side of each platform an automatic exit door is provided.

The dimensions of these proposed new cars follow:

| | |
|---|---|
| Length over bumpers | 48 ft. 11 in. |
| Length over corner posts | 32 ft. 9 in. |
| Length of platform | 8 ft. 1 in. |
| Width over drip rails | 8 ft. 6 in. |
| Width over side girders | 8 ft. 4 11-32 in. |
| Height from rail to top of trolley boards | 11 ft. 6 in. |
| Truck centers | 22 ft. |
| Seating capacity (car body) | 48 |
| Seating capacity (platform) | 6 |
| Total seating capacity (single unit) | 54 |
| Estimated weight, completely equipped | 38,000 lb. |

In operating these cars in trains of two it is believed that a great advantage will be obtained by the proposed arrangement for loading passengers at the center of the train, so that the boarding passengers may enter at one general location, rather than to split up the loading points, as would be necessary in other types of cars. This decision as to the method of loading was arrived at after studying various loading problems in connection with surface car train operation, and it has been demonstrated that a more equal distribution of the passenger load is obtained by this method.

In considering the weight of a car in relation to the entrance and exit facilities, it is not believed that too much consideration should be given to the use of but one step between the car floor and the street level, as it has been found that where steps are reasonably low and comfortable and a landing platform (or what is termed in some cases reservoir capacity) of sufficient size is provided, the movement of passengers is accelerated, even though another step is imposed in the form of a riser, from the platform to the car body, or from a well in the center of the car to the car body.

Wheel diameters affect this question, and in some cases where 26-in. wheels are used it is possible to get a low step, and at the same time, by means of ramps, so to design the entrance and exit passageways that one step only is required between the street level and the main floor of the car. In the writer's opinion, however, this practice does not tend to produce as good design as that of the drop platform or the well depression in the center of the car.

The side girder construction of this car consists of plates of No. 12 sheet steel, 30 in. wide, reinforced at the top and bottom, to which are riveted U-shape steel posts. These posts are riveted at the top to a sheet steel letterboard. The whole side of the car from the bottom angle to the top plate forms the girder for the car body.

The side posts are made of No. 16 gage steel, formed into a U-shape, with the closed end riveted to the side girder sheet. The wood filler is inserted in the open end of this U and is 1¼ in. deep. The parting strips and pilasters are screwed to this wooden strip. This type of post was used in a lot of 45 double-truck, one-man cars that were built and placed in service about a year ago, and satisfactory results have been obtained from them up to the present time. (See ELECTRIC RAILWAY JOURNAL, issue of Jan. 14, 1922. A number of them have been damaged by collisions, but it has been found that repairs can be readily made, with little or no more expense than in the case of wooden posts. This U-shape post is lighter and stronger than any other type of metal post we have been able to design. It is 27 per cent lighter than the 1½-in. x 1½-in. T-post which is being used somewhat generally in car construction at the present time. Tests have shown that the U-shape post, in comparison with the T-post, has 12 per cent less deflection, figured in 1,000 in.-lb., of bending moment when applied in the transverse direction of the car body. When the bending moment is applied in the longitudinal direction of the car body the U-shape post has a deflection which is 76 per cent less than that of the T-shaped post. The figures for both weight and deflection are for complete posts, with wood fillers or covering.

The wood filler for the U-shaped post has been so designed as to be readily removed to permit painting of the posts on the inside.

Plywood, ¼ in., is to be used for the roof. This is screwed to the wooden carlines and made in three sections, with butt joints. This plywood roof, shaped to form, we find to be very stiff and lighter than the ⅜-in. roof made with poplar boards, and while the cost is approximately 90 per cent in excess of the cost of the ⅜-in. poplar finished roof board (material only), the labor of installing the plywood roof is less than that of installing the poplar. The total cost of the plywood roof installed exceeds that of the poplar roof by about $30 per car, but as there is a saving of approximately 200 lb. per roof, we believe that we are warranted in making the increased expenditure, hoping that with a more general use of plywood for this purpose the cost will be reduced.

By the use of plywood, which gives a stiffer roof construction, we are enabled to use a lighter steel carline, the dimensions of which are 1½ in. x ¼ in. This compares with a steel carline 1½ in. x ⅜ in. used with the poplar roof construction. This reduction in weight of the steel carline is included in the 200 lb. saving in roof construction weight.

Experience has shown that the roof covering of a car is something that needs special attention, and that the ordinary procedure of covering a roof with cotton duck laid in white lead and painted with roof paint does not necessarily make a tight roof covering. It has been found necessary to use either prepared roofing materials or to treat the canvas with a waterproof treatment, which permits the canvas to remain in a flexible, soft condition throughout its life. The use of white lead and the usual roof paints, when applied upon the untreated cotton duck, generally results in the cracking of the paint. This permits rainwater to work through the cracks and the seeping action seems to extend clear through the canvas. By the proper treatment of the duck, or the use of treated canvas, this difficulty is avoided.

Cast steel bolsters of I-beam section 10 in. deep in the center are used. The average weight of these bolsters is 520 lb. These bolsters are tested with a center load of 22 tons, with bolster supported at side sill supports.

The length of the platform used upon the Chicago cars is much longer than that of the average city car, extending 8 ft. 1 in. from the end sill to the outside bumper. The outside platform knees are formed of 8-in., 13.75-lb. channels, reinforced top and bottom with 2-in. x 2-in. x 5/16-in. angles. In addition, the web is reinforced at the point of support with a 7-in. x ½-in. x 32 5/16-in. plate.

It is desirable to keep the fiber stresses in the platform knees low, and it is the practice in Chicago to keep the stresses below 10,500 lb. per square inch. The point of maximum stress occurs at the end sill. The platform framing is designed for the use of radial couplers and ample cross bracing is provided.

Chicago's climatic conditions necessitate the use of a double floor for warmth, and in order to obtain this with as light a construction as possible the practice has been as follows. The lower floor is ⅝-in. thick fir, then a layer of 1/16-in. thick building felt, on top of which is laid a ⅝-in. maple floor. In the aisles the ⅝-in. maple floor is grooved to form the aisle mats. This makes a total thickness of floor of 1 5/16 in., and while the weight is in excess of a single 1 3/16-in. floor, it is necessary, as previously stated, for the local conditions, and illustrates a condition where weight is added to the car to provide for the comfort of passengers.

This design of car calls for two trap-door openings over each motor, with a space of about 8 in. of flooring between the trapdoors, which is built in solid between two tees. This 8-in. strip is built in so as to form a solid fastening for the motor cables and motor junction boxes, which are installed at this location.

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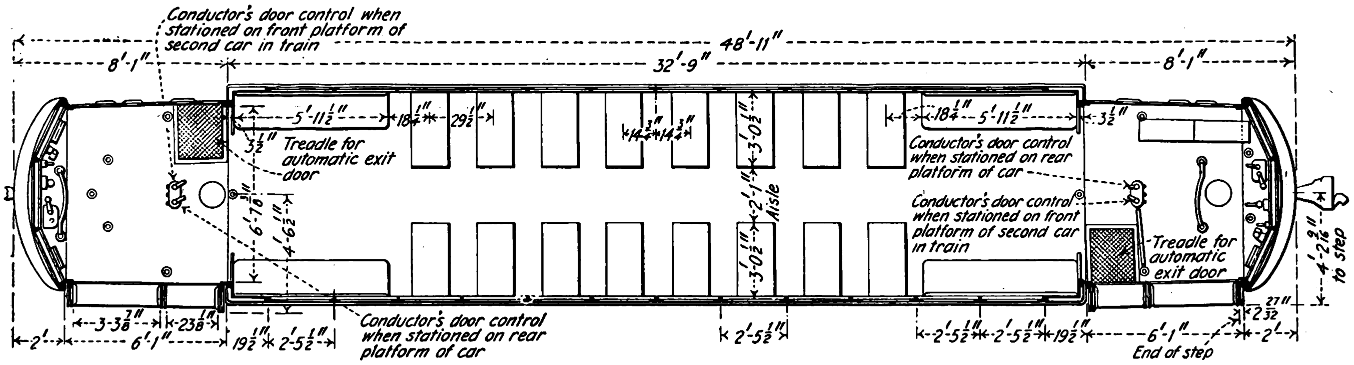
*Abstract of paper presented before Illinois Electric Railways Association, at Chicago, March 26-27, 1924.

The posts are spaced 29½ in. center to center, and the lower and upper sash are designed so as to permit the use of standard size glass, thus eliminating the necessity of glass cutting. The lower sash takes a glass 24 in. x 26 in. and the upper sash 14 in. x 26 in. In this connection, the writer desires to point out that these dimensions correspond with the recommendations of the committee on unification of car design, as presented to the American Electric Railway Engineering Association, in convention, October, 1922, which recommendations, it is understood, are to be reaffirmed this year, and he desires to show that this represents good practice in car construction, the Chicago Surface Lines having used them upon the last four groups of cars designed totaling 445 cars.

Each platform is provided with three sets of doors on each side, pneumatically operated and controlled in the following manner:


Conductor's door control when stationed on front platform of second car in train
48'-11"
8'-1"
32'-9"
8'-1"
5'-11½"
18¼"
29½"
14¾"
14¾"
3½" Treadle for automatic exit door
6'-7⅜"
4'-6½"
3'-0½"
2'-1"
Aisle
3'-0½"
18¼"
5'-11½"
3½"
Conductor's door control when stationed on rear platform of car
Conductor's door control when stationed on front platform of second car in train
Treadle for automatic exit door
4'-2 9/16" to step
2 27/32"
2'
3-3⅞"
23⅛"
6'-1"
19½"
2'-5½"
Conductor's door control when stationed on rear platform of car
2'-5½"
2'-5½"
2'-5½"
19½"
6'-1"
2'
End of step

Floor Plan of Proposed One-Man, Two-Man, Multiple-Unit Cars for Chicago, for Use in Trains

All doors swing outward. On the left hand side of the platform No. 1 end the three sets of doors are to be operated in unison from one door engine and are to be controlled from the conductor's door control valve, located in a conductor's door control stand. The corresponding doors on the right hand side of the No. 2 end of the car are to be operated in the same manner. On the right hand side No. 1 end the two sets of doors nearest the vestibule corner post are to be operated in unison from one door engine controlled by either the motorman's brake valve or the conductor's door control valve. The one set of doors nearest the body corner post are to be automatically operated by another door engine, by means of a treadle, and are put in operating position either by the motorman's brake valve or the conductor's door control valve. The corresponding doors on the left hand side of the No. 2 end are to be similarly operated. The piping is to be so arranged that three sets of doors on the right hand side No. 2 end may be controlled from the conductor's position at No. 1 end, and the corresponding doors on No. 1 end are to be controlled from the conductor's position at No. 2 end. This permits the remote control of these doors at terminals, or for use in the future at subway stations. In addition, the last-mentioned sets of doors on each platform are to be arranged with a street collector's valve, for operation from a position in the street, at congested points on lines or at terminals. The decision to install automatic doors on these cars was arrived at after careful study and a thorough trial on a group of 45 cars, which have been in successful service for a year or more. It was decided that automatic doors would facilitate the exit of passengers, both when the cars operate as single units or in trains of two or more cars.

The type of electrical equipment to be used; that is, whether four-motor or two-motor, affects the problem of weight, even though the total horsepower of the motors is practically the same. In other words, a car that is designed to operate at good motor efficiency equipped with two 60-hp. motors will weigh about 1,000 lb. less than if four 35-hp. motors are used. (This would be the size of the motors that would have to be selected as being the nearest in equivalent horsepower to the two 60 hp. motors). The four 35-hp. motors would, of course, give a surplus of 20 hp., or an increase of 16⅔ per cent. In addition to the saving in weight there will be a substantial saving in the initial cost of the electrical equipment by using two 60-hp. motors.

In analyzing some of the weights per horsepower, based upon the manufacturer's rating of the motors, and the light weight of cars, it is found that with four-motor equipments that were placed in service about 1907-08 the weight ran about 265 lb. per hp. This was with motors of the non-ventilated type that had armature speeds of approximately 635 r.p.m. at 600 volts. An analysis of recent four-motor equipments installed in Brooklyn, St. Louis and Boston shows 285 lb. per hp., or an increase of 7.55 per cent. These last cars are equipped with motors having, in the case of Brooklyn and St. Louis, armature speeds of approximately 1,125 r.p.m., and in Boston 1,236 r.p.m. at 600 volts.

In the two-motor equipments, it is found that some of the light-weight equipments designed and put in service in 1912-13 averaged around 300 lb. per hp., and at the present time, we find that an analysis of the two-motor equipment of the latest Philadelphia Rapid Transit Company's double-end car runs about 314 lb. per horsepower. The proposed Chicago Surface Lines car will run about 316 lb. This gives an average of 315 lb. per horsepower, which is a 5 per cent increase over and above the 1912-13 average. The latest design of two-motor equipments has armature speeds of from 725 to 770 r.p.m. at 600 volts.

The above illustrates that there has been a gradual tendency to increase the weight per horsepower based upon the light weight of the car. This has been brought about by the lighter weight, higher speed, ventilated type of motor.

From tests recently made with modern two-motor equipments upon a car weighing light 38,000 lb., in service where the schedule speeds have run as high as 12.5 m.p.h., with stops of approximately six per mile and of six seconds duration, it has been found that on these modern two-motor equipments the average temperature rise has run very close to 55 deg. C., showing that from the standpoint of heating the motors are capable of taking care of a load of at least 315 lb. per horsepower, without excessive temperatures. The above figures are based upon tests made in Chicago upon one of the fastest crosstown lines. The average passenger load during the tests was 37.

It is believed that in the selection of an equipment for light-weight city service cars serious consideration should be given to the use of the two-motor equipment, for the following reasons:

1. A two-motor equipment is lighter than the corresponding four-motor equipment of the same, or approximately the same horsepower.
2. The first cost is less per equipment.
3. Lower armature speeds.
4. The use of two large units instead of four smaller units.
5. Lower maintenance.

In considering the use of a two-motor equipment, due allowance has to be made for local conditions, as it is recognized that while these equipments may be operated in territory where grades as high as 5 per cent or even greater are encountered, for grades in excess of this a four-motor equipment would probably be desirable. A careful analysis should be made covering each condition before a final decision is reached.

The control equipment under consideration for use on these cars is the light-weight multiple-unit type.

We have specified on this group of cars a 10-in. x 12-in. brake cylinder, with an idea of equipping our cars so as to give a braking ratio not to exceed 1 to 10, in order to get the best possible results from the standpoint of a liberal range in the brake adjustments. This, we believe, will reflect itself in our power consumption, by permitting our brakes to be adjusted freer and, at the same time, operated with adequate safety.

The heating equipment to be installed in these cars consists of 22 heaters of 400-watt capacity at 500 volts, and two platform heaters of 1,200 watts each, making a total of 11.2-kw. capacity for the heaters. All heaters in the car body are under thermostatic control. The platform heaters are to be wired in series, under independent switch control. This gives a heating capacity of 4.6 watts per cubic-foot of contents.

In deciding upon the seats to be used in these cars, it has been determined to use spring cushion backs as well as spring cushions, in order to give added comfort. This is another item where weight has been added for the comfort of the passengers.

The trucks will be of the maximum traction type, with 63 per cent of the weight on the drivers. The diameter of the driver wheels is 28 in. and the pilot wheels 21 in. By using a maximum traction truck instead of the usual type for four-motor equipments, a considerable saving in weight is made.

The cars are to be provided with automatic car and air couplers. This equipment usually runs slightly less than 1,000 lb. per car. Electric jumpers will be provided between cars for carrying train line and bus line circuits.

The total weight of the car, completely equipped, is estimated at 38,000 lb., subdivided as follows:

| | Weight in Pounds | Per Cent of Total |
|---|---|---|
| Bare car body | 14,500 | 38.2 |
| Trucks, complete with wheels and axles, but without motors and gears | 10,200 | 26.85 |
| Total electrical equipment | 6,590 | 17.33 |
| (Motors, lb. 5,000 13.10%) | | |
| (Control equipment, lb. 1,590 4.18%) | | |
| Air brake and piping | 1,765 | 4.63 |
| Hand brake, seats, heaters, registers, thermostats, conduit and fittings, destination signs and miscellaneous | 3,965 | 10.41 |
| Couplers | 980 | 2.58 |
| | 38,000 | 100.00 |
| Weight per foot, over all | 776 | |

# How the Motor Coach Can Be Utilized in the Transportation System*

By G. T. Seely

General Sales Manager Yellow Coach Manufacturing Company

SMOOTH, hard surfaced roads are essential to successful motor coach operation. Little progress was made from 1902 until the last few years, when the number of coaches has increased at a rapid rate because of the more rapid improvement in road conditions.

Quantity production has placed the private automobile within the reach of every one. The yearly production of passenger automobiles and trucks in this country increased from 485,000 in 1915 to 4,012,856 in 1923, or more than eight times. At the end of 1923 there were registered in the United States 15,223,658 automobiles and trucks, or on the average of one for every 7.2 persons.

With this rapid increase in the use of motor vehicles, there came a corresponding improvement in the condition and mileage of hard surfaced roads. While the advantages of good roads have always been apparent, the urge toward improvement and extension of hard roads became greater as the number of persons owning automobiles increased.

Owners desire paving in front of their homes to provide the opportunity to drive their own automobiles to and fro, irrespective of weather or time of year. They cheerfully pay license fees for the maintenance of roads and pavements. Practically all fire apparatus is now motor driven. In cities and villages, deliveries of nearly all such necessities as coal, ice, foods, building materials, etc., are made by motor trucks, made possible by good pavements. In 1923 there were registered in the United States a total of 1,767,515 motor trucks of all kinds, engaged in business enterprises or private hauling.

In the January, 1924, issue of *Bus Transportation* it was estimated that there were between 40,000 and 60,000 motor coaches of all types in service at the end of 1923 in the United States. At the same time there were 83,000 railway passenger cars in operation in this country. These figures show that in a comparatively few years the motor coach has become a most important factor in transportation, even though the number of vehicles thus used amount to approximately only three-tenths of 1 per cent of the total motor-driven vehicles in this country, or 3.4 per cent of the number of trucks in operation.

The essential difference between electric street car or interurban car operation and motor coach operation is that in cities electric cars require an expensive roadbed laid in paved street, or ballast, ties and rails constructed on a private right-of-way for interurban lines; while motor coaches require only a hard surfaced road, used in common by private individuals and the very large number of industrial and commercial vehicles daily engaged in business enterprises.

Motor coaches can make on the average schedule speed as high as or higher than the average street car or interurban line. They have a range in seating capacity from a small 12-passenger vehicle up to a double-deck coach, seating 67 passengers.

There are many electric railways that have miles of tracks that now need or soon will need rebuilding. In many cases these are single-track lines with passing tracks. The growth in traffic due to the growth of the city since the tracks were built makes double-track construction necessary, either now or long before new track would be worn out. In a situation like this the railway manager is faced with an expenditure of from $100,000 to $125,000 per mile of line for new track, a sum practically four times the original cost of one track, due to double track instead of single track, higher standard of costs and more substantial character of present-day track construction. In some cases a street is too narrow to permit double-track construction. A motor coach line has all the operating advantages of a double-track street car line and the only expenditure necessary is that for coaches and a garage.

As a city develops and expands, it has been necessary for the electric railway to extend its lines in very thinly-settled districts.

With such a useful tool as the motor coach, the railway company can agree to furnish service when pavements are built. Because of the universal use of the automobile and delivery trucks, hard surfaced pavements in a new subdivision are much more of an essential than formerly. The railway operator can logically refuse to put $50,000 to $60,000 per mile of single track in subsurface construction on a line that will not pay for years.

In many cities the standard distance between street car lines is from 2,000 ft. to 2,640 ft., this spacing being selected to minimize the expense of constructing the permanent roadway. This arrangement requires a long walk for persons living midway between lines. Wherever such lines require rebuilding, the transportation company may install motor coach service with routes much closer together, reducing the number of vehicles on any given street and reducing materially the average walking distance to and from the transportation line. This will reduce the time required for the journey between the origin and destination of the passenger. This added convenience will materially increase the number of passengers using the transportation lines and induce many to use a public vehicle rather than their own car, thus materially reducing street congestion.

It is possible to install motor coach service on residential streets where it would be impossible to secure the right to construct new street car tracks, because of the absence of objectionable noise from operation.

Electric railway companies may utilize motor coaches also to increase the schedule speeds of their service. One company operated a section of track several miles long from which several radiating lines branched off. Complaints had been received as to the low speed on these lines and the long time required for the trip to and from the center of the city. Motor coaches were employed to handle the local traffic on this section of the line, only a few stops being made by the street cars. Four to five minutes were saved by each street car, enabling a number of cars to be diverted to other uses. The savings more than paid for the addition of the motor coach service and all the patrons of the line were pleased.

In cases where an extension of an existing line is required, motor coaches can be employed to serve the new territory, also serving the outer portion of the existing car line, and then running express with limited stops to the business center, saving time for the longer riders and, by relieving the street cars, either permit the removal of one or more cars, or provide additional seats for an increase in traffic.

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*Abstract of a paper presented before joint convention of the Illinois Gas Association, Illinois State Electrical Association and the Illinois Electric Railways Association, Chicago, March 26 and 27.

Limited stop service with motor coaches can be employed in any section of a city served by a long car line with heavy traffic. This service can be routed on adjacent streets, relieving congestion on the car line and, by the faster speed, and reduced walking distance, increase riding. Service of this character performed with double-deck coaches presents the possibility in large cities of deferring the construction of subways or elevated railroads in territory outside of the business section, except perhaps in the very largest cities.

Years ago riding on electric cars purely for pleasure in the summer was an established practice. With the advent of the automobile this class of traffic practically disappeared. The motor coach offers the transportation company a new way of securing this pleasure riding, especially if double-deck coaches are used. In many cities, where private automobiles that have been laid up during the winter are put in service in the spring, there is a noticeable drop in street car revenue. The upper deck of a double-deck coach provides a means of pleasure riding that is fully taken advantage of on warm evenings, Sundays and holidays, by those who do not own automobiles and by those who do.

It has been generally considered that the double-deck coach has a field only in the larger cities, but I am confident that it will be demonstrated that double-deck coaches will be found to be a real means of selling transportation in cities with from 30,000 to 50,000 inhabitants. They will be of especial value where there is a lake, park, or place of amusement some distance from the center of the city.

Some electric railway officials feel that motor coach operation is something entirely different from their previous experience. As a matter of fact, practically the same transportation principles govern as in electric railway operation, and there are less operating difficulties because of the flexibility of the gasoline-driven vehicle.

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# Educating the Public*

By Luke Grant

Manager Publicity Department, Chicago, North Shore & Milwaukee Railroad

EDUCATION of the public is the most important phase of electric railway operation. Without the good will and co-operation of the public no electric railway, or other public service company, can be entirely successful. The truth of that statement is axiomatic. How to educate the public, however, is a real problem. No formula can be given for general application. Each community has its own peculiar problems and its interest is only passive, if it has any interest, in the problems of other communities.

In this brief discussion of the subject I mean to confine myself largely to one phase of the problem. I think it the most important phase. The objective I have in mind is to "personalize" a company. I use the term "personalize" because it seems the most appropriate to express the idea I have in mind.

Since the corporation first was formed to carry on business on a larger scale than was possible for the individual firm or partnership, it has been referred to as "soulless." Without the corporation, modern business could not be carried on, yet it is still spoken of as being "soulless," although less so than was the case a few years ago. Public sentiment is gradually changing, due to the better understanding of the fact that the corporation has developed a soul, or a spirit. In the case of the public utility, at least, it is a spirit of service. If a corporation does not wish to be referred to as "soulless" it must prove by its actions that it is not.

The inspiration for this soul, this spirit of service, must spring from the head of the corporation. It must permeate every department and be infused into every employee from the highest to the lowest. That accomplished, the "personalizing" of the company to its customers—the public—will follow as a matter of course, through the co-operative effort of all the employees.

To the patron of the electric railway the employee with whom he comes in contact is the personification of the company. He is the one who expresses the spirit of service or the reverse. If each employee with whom the passenger has contact makes a favorable impression, the effect is cumulative. He has "personalized" that company to the customer and he extends the contact to others. To illustrate what I mean I will cite one or two typical instances.

## Typical Instances Quoted

A young mother, with a baby in her arms, is traveling on the North Shore Line from Chicago to Milwaukee. The baby is fretful and crying. The trainman approaches the mother in a sympathetic way, plainly indicating by his manner that he would like to be helpful if the mother could tell him how. She says the baby is hungry, but she has no way of warming its feeding bottle. "I believe I can have it warmed up," said the trainman. He went to the dining car, returning in a short time carrying the baby's bottle on a tray wrapped in a table napkin and handed it to the mother. The mother was grateful and offered the trainman a dollar bill. He declined the gift with thanks. "That is part of the service of the North Shore Line," he said simply, as he returned to his station on the platform of the car.

A significant point to that story is that it was neither the conductor nor the young mother who reported the incident. It was another woman passenger, a stranger to the mother and to the conductor, who wrote a letter to the editor of our company publication relating the story substantially as I have told it. She was so impressed that she felt she ought to commend the act of courtesy.

What has that story to do with the subject of this paper, "Educating the Public"? It has everything to do with it. The passenger who wrote that letter was given a more favorable impression of the company in five minutes than she would have obtained from reading newspaper advertisements every day for a year.

A traveling salesman boarded a train recently to go from Chicago to Milwaukee. It was early in the morning. He handed the conductor a mileage book and headed for the dining car. He ordered breakfast and when about to pay his check discovered that in his haste he had left his home without any money. He explained his position to the waiter. "That's all right, sir," said the waiter. "I'll pay the check and you can pay me on your next trip." The traveler did not wait for his next trip to pay that debt. He sent the amount—with something added—to that waiter immediately he reached home. The waiter proudly exhibited the letter he received. What impression did the traveler get of the company? It is safe to say that it was favorable and that he has told others about the incident.

One more incident and I am through with the human interest stories. A young man who works in Chicago and whose parents live in Milwaukee had spent the week-end with his folks. Returning, he had to take a train leaving at 5 o'clock in the morning. When about to purchase his ticket he discovered he did not have enough money in his pocket to pay the fare. He had friends in Milwaukee who would readily have cashed his check, but they were still abed. He bought a ticket to Racine, intending to get off there, get a check cashed and wait for a later train. He told the conductor of his dilemma. "I am not supposed to accept checks from strangers," said the conductor, "but I'll take a chance." The young man was very grateful. On reaching Chicago he wrote a letter to the editor of our company publication giving the details of the incident.

The thought may occur to you that these are isolated incidents and that the effect they have on the education of the public is infinitesimal, because the thousands of passengers daily carried on a railroad cannot be won over by such personal attention. The effect, however, is much greater than might be supposed at first glance, because it is cumulative. It is not alone the passenger receiving the attention that is favorably impressed. Others in the same car notice these things, they speak of them after leaving the car. When such incidents occur day after day, when they come to be recognized as a fixed policy of a company, such a company has traveled a long distance on the road to the education of the public.

I have dealt with only one phase of the education of the public; that is, "personalizing" a company through its employees. There are other phases on which my time does not permit discussion. I wish, however, to make one more point before concluding.

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*Abstract of paper presented before the Illinois Electric Railways Association, Chicago, March 26-27, 1924.

Under public regulation the electric railway, or other utility company, has no secrets. Its cards are always on the table, face upward. Educational work should be directed toward driving home that fact. Where there is secrecy, there is sure to be more or less suspicion, and suspicion grows into distrust. Nothing is gained by withholding information about a public service company from its customers. I do not mean that it is necessary for a company to broadcast every intimate detail of its business. The public has no interest in such details. But the public is interested in a general way in the operation of a company that is supplying it with an essential service, and the more information of that character given the better it is for the company.

Every utility company wishes to have the confidence of its customers. It must therefore take its customers into its confidence, and by its fair and square dealing with them convince them that it really has a soul, a spirit of service.

# Educating the Management*

By W. H. Sawyer

President East St. Louis & Suburban Railway

The word "education" is a most misused word. We not only misuse the word itself but we use it in a sense which is detrimental to ourselves, to our associates, and to our business. I have heard many tell how we must educate the public, how we must educate our associates—wrong, all wrong. Who are we who are on such a high plane that we can educate all others? Education is all right, but education begins at home, begins with ourselves. It is not our business to educate others. We have no right to seek to educate others.

The only basis on which we have any right to educate others is in the sense that we have a right and a duty to impart information to others. But to teach them, train them, discipline them, tell them what they can do, what they must do, is not within our province. It would be far better to discuss the education of executives, of engineers, of transportation men, of publicity men. If properly educated ourselves we may then be able to impart knowledge to others which will be helpful to us and to them. The problem, therefore, is how best to educate ourselves, not how best to educate the public or our employees.

Due to lack of education we ourselves have been to blame for a large portion of the ills which have befallen the electric railway industry in the past. The electric railway man's duty is, first, to give service, efficient, satisfying service; second, to give the public, our customers, facts, all the facts regarding our business. The executive who is not following this plan today displays his lack of education, and is the one who needs to be educated.

In order that you will not misjudge my remarks I want to say now that the electric railway executive of 1924 has already acquired a considerable education and appreciates the fact that his education is not complete and that he must acquire a better education so that he may be better able to conduct his business. The great big majority of electric railway executives today are not trying to educate their public, because this is not their duty nor their right. What we are doing today, and doing far better than was ever done before, far better than any one even five years ago thought it was possible to do, is to give real service and real facts.

Doing these things as we are now doing them has brought about a most favorable reaction. Electric railways are as a result giving better service, carrying more people, and what is of most importance, our electric railways are in better repute, less criticised, and less open to criticism than ever before. Never before have we received the co-operation from the public that we are now receiving. We have a right to be proud of what has been accomplished. But what has brought about this result? Not the education of the public, but our own acquisition of education.

Our customers are entitled to the facts concerning our business. The best way to give these facts is through publicity in the advertising columns of the newspapers. If we follow this general plan we need not worry about the education of the public. All we need do is to follow along the trail blazed by Britton I. Budd, and then we will not have to meet and talk about the education of the public.

Now, just a word along similar lines regarding the education of our employees, our associates. All that I have said regarding the necessity of educating ourselves instead of the public applies equally well to the so-called education of our employees. We must meet our employees also from a 1924 standpoint. We must recognize that our employees, our associates, must have a pride in what they are doing and in what we are doing. We must recognize that they are our associates and part of our business. We need their co-operation, but we need not go out educating them. We, ourselves, must perform in such a way that we merit their confidence, and so that they appreciate that our interests are mutual, then we will receive their co-operation. They do not need education, but will fall into line when we conduct ourselves so it is easily recognized that it is to their interest to co-operate with us. We must be human, we must be fair, and we must recognize the part they play in this big industry of ours.

None of us have reached the point in our own education that we are in the best position to do all the things that we should do for our associates. It does us good to gather together like this and talk over the things which have been accomplished toward bringing about co-operation from our associates.

There is one little thing we have done down our way that has been very helpful in bringing about co-operation. Some years ago we had street cars that were swept at times and washed at times. We had motormen and conductors that were at times courteous and helpful to our customers, but a lot of the time things were not as they might have been. But those men were not to blame that their customers were not always treated courteously, because in the past we executives and operators were satisfied to give this kind of service. I did not try to educate these men but I tried to gain their co-operation, and I believe I am succeeding. I did not go out and damn them because the cars were not clean. I did not go out and damn them because they were not courteous and helpful to their customers (we never even called them customers in the old days, they were just people that rode street cars, rode street cars because they had to ride them).

Our first step was to get a true picture of just what we were doing. In order to do this I hired, so to speak, half a dozen people, whose work required their riding the cars a considerable portion of the time, to report to me what they saw when they rode our cars. I explained to these people what we were trying to do and then asked them to tell me if we were doing it. I asked them to pay particular attention and give me detailed information concerning those men who did something better than the average. If they saw a conductor or motorman do an especially courteous act I wanted them to be sure and tell me about it and give me all the details. Whenever I received a report of an especially courteous or helpful act I immediately wrote the conductor or motorman a personal letter, telling him of the report I had received and "as a slight token of my appreciation of his helpful attitude" I inclosed a $5 bill. The $5 did not buy that man; my writing him a commendatory letter did not change him from black to white, but it did do this—it let that man know I wanted to co-operate with him to give satisfying service, and it also let him know that I appreciated he was part of our big industry.

As time went along I kept telling the public about these courteous acts and about how these men were trying to be courteous, and about the pride I had in them for being courteous. We got to the point that I asked the public, invited the public, begged the public to tell me what they saw on the street cars. I told them I wanted criticisms if they had any, but I particularly wanted them to tell me whenever they saw any of our men doing something especially helpful. In the course of time I received a real response from our customers. I got to the point that I did not have to pay people to tell me of helpful acts; our customers did it voluntarily. Why? Because we were performing; because we were doing the things that bring about satisfying service, and because we were going to our public, our customers, and talking to them through newspaper advertisements telling them what we were doing, and what we were trying to do. That is why we got a response from them. They knew what we wanted to do; they knew that what we wanted to do was mutually helpful and were willing to co-operate with us.

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*Abstract of a paper presented before the Illinois Electric Railways Association, Chicago, March 26-27, 1924.

About the same time that we started what some people would call a courtesy "campaign"—I never call any of them "campaigns," a campaign means something that you do for a short time—a whirlwind affair; we also took another hold of ourselves in regard to clean cars. We doubled the force in the car-washing shop; we washed our cars twice as often; we washed windows in between car washings, so we washed windows four times as often. We then put a broom on each car and asked the conductor or motorman to sweep the car at the end of the run. Of course they did not all do it right off; they were not used to sweeping out cars—some of them said they were not porters. We did not damn them if they did not do it, but whenever we found an especially clean car I wrote the man a letter and sent him a $5 bill. They commenced to have a pride in keeping their cars clean; they commenced to want to keep their cars clean. Of course, they do not now all keep their cars as clean as we would like to have them, but a lot of them do. One thing is sure—they are practically all doing a better job than they used to do.

Now these are two things, two small things, that we have done down our way to bring about better public relations and better employee relations. We have tried to more nearly satisfy our customers by cleaner cars and more courteous and more helpful platform men, and at the same time have materially increased the co-operation from our associates. This was brought about by the education of ourselves. There are many other little things that we have done down our way in which we have a real pride. Do not misunderstand me, we down our way are not educated; we still have a lot to learn, but until we more nearly perfect our own education we are not going to complain of the lack of education on the part of our customers or our associates.

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# Education for the North Shore Line Employee*

By C. G. Goodsell

Educational Director Chicago, North Shore & Milwaukee Railroad

In our educational program for employees of the Chicago, North Shore & Milwaukee Railroad we began with the laborer out on the right-of-way. This was in 1921, and as this work of teaching these men English, citizenship and trackwork began to attract attention the inquiry came from other employees as to why not educational work for them? A trainman inquired about an opportunity to learn to speak better English. Another wanted to know what he should study to be in readiness for some advancement. A merchandise dispatch agent asked about getting a better knowledge of freight traffic. In one department an official stated that not a foreman could make a rough shop drawing which would give one any conception of what he had in mind. Many other evidences indicated the need of a company-wide educational program.

It was about a year ago that the educational service of the road was finally extended to employees of all departments by the appointment of a new educational committee and the enlarging of the field of service of the educational director to cover the broader work. About this time a letter went out under the signature of Britton I. Budd, president of the road, encouraging the educational efforts of the employees and stating that the company would be glad to share the expense where any was incurred in pursuing courses which would better equip one for work with the road.

As a result of this indorsement of the educational movement by the management a great many employees began to think about the matter of education and many inquiries were received. In a few months 150 interviews had been held with the supervisory force and employees desiring more education and much valuable data relative to the needs of our employees was secured.

Immediately steps were taken to meet these needs through outside educational institutions or our own classes as the conditions warranted and as a result the following subjects have been studied by our employees during the year: Air brakes, arithmetic, acetylene welding, accounting, blue print reading, shop drawing, railway surveying, public speaking, English, electricity, freight traffic, freight car repair, foremanship, mechanical drawing, office management.

Short courses were conducted by the company in air brakes, blue print reading and shop drawing, English and public speaking. Private instruction has also been given in electricity, mathematics, sheet metal drafting and shop drawing. Arrangements were made last fall with the public evening schools in Milwaukee and Kenosha, Wis., for our employees to attend classes even though they were not residents of these cities. We also have students in evening classes at Northwestern University School of Commerce, Armour Institute and De Paul University in Chicago and a commercial business college at Waukegan, Ill. Home study courses are being taken by a few of our employees through the Railway Educational Bureau of Omaha, the Milwaukee School of Engineering, LaSalle Extension University and others. Over 200 employees have been enrolled in our own classes during the year and about seventy enrolled in outside institutions.

An experiment in educational clubs is being made which looks attractive. A track foreman's club, an office boys' club and a public speaking club have been tried so far. Some difficulties enter into the problem in the case of the boys' club, but the two others indicate that more educational clubs may prove a successful part of our program.

We hardly need say that the easiest part of this educational program is the enrollment of the students. The real work comes in keeping the man "at it" until he has completed something. As you know, over 90 per cent of those enrolling in correspondence school courses in this country never complete them and our crowded city evening schools usually find they have plenty of room for more students after a few weeks of hard work. This is no argument for abandoning the task, however; it simply means that the average man is naturally a "quitter" and that he needs help. It means that some one is needed on the job for the express purpose of helping the average man get the education he needs for the job he is holding or for the better one ahead.

Most of the programs laid out for the education of the man in industry are not attractive enough to hold him. The work is often not elementary enough for the average and usually the courses cover so long a period that he is discouraged before he starts. We have often heard officials say, "If the man hasn't the stuff in him to stick to a course of study and complete it, let him go. I stuck and I didn't have half the chance this fellow has had." Now, as a matter of fact, we have no business "letting him go." It's the average man that makes up the great army of our employees, and when we let him go we simply say we are going to cripple along with an inefficient, untrained force and a high labor turnover. Better say, "We'll find the difficulty and remedy it." Too little time and thought has been spent on this problem.

Some one has said, "Carter's Little Liver Pills never would have had half the sale if they had been Carter's Big Liver Pills." So it is with education. Small doses, and if necessary sugar-coated, will get results never secured from long courses offered in an unattractive form. But I hear some one say that a short course does not amount to shucks. I differ absolutely with that statement. A short course does amount to a great deal. In the first place even one hour a week for ten weeks may put a man on the road to bigger and better things if the right kind of a man is teaching him. It gets a man out of his rut. He begins to get a vision of the things beyond. He begins to feel the joy of mastering something. If the course is a practical one, as it usually should be, each lesson gives him something which he sees will come in handy on his present job or the job ahead. It often is the means of getting him interested enough to dig up the technical books he has stowed away at home and make them a live source of information. It literally takes that man out of the class of the "standstills" and puts him in the "go aheads."

There is another effect also which should not be overlooked. That man immediately begins to think a little more of himself, to stand a little straighter, to feel a little more as though life was worth living. You show me a bunch of men in your employ who are studying some practical subject together, no matter how simple or short the course may be, and I'll show you a bunch of men who are making for a better spirit; they'll be boosters rather than knockers.

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*Paper presented before the Illinois Electric Railways Association, Chicago, March 26-27, 1924.

We are now working on short courses to be offered on our property which will be so related to each other that a man may take a single short course in blue print reading, shop drawing, shop arithmetic, air brakes, principles of electricity, car wiring, electrical signals, motors, etc., or he may take a combination of several of these subjects, using two or three nights a week, so that he will in the course of time have a large amount of technical knowledge which will apply to conditions as they exist on our property.

This will be, we believe, training of a grade within the reach of the average man. The man with a very limited education and only ordinary perseverance but able to give good service may develop into a valuable man to the company and a better provider for his family.

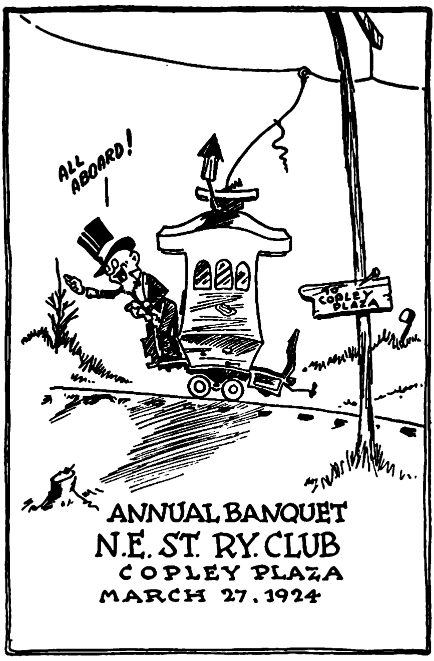
## New England Club Has Usual Rousing Annual

NEARLY five hundred attended the annual banquet of the New England Street Railway Club at the Copley Plaza Hotel, Boston, March 27. As is customary at this meeting, the only business transacted is the election of officers late in the afternoon. The evening banquet is given over entirely to prominent speakers from outside the railway field. This year the club was particularly favored. Those who accepted places on the program were the United States Senator from New Hampshire, the Governor of Massachusetts and the Mayor of Boston.

President Ralph D. Hood delivered a brief address on the activities of the club, which has had one of its most active years, then introduced former Massachusetts State Senator Robert M. Washburn, who acted as toastmaster and certainly made the most of his opportunities.

United States Senator George H. Moses spoke briefly on the spirit of suspicion and innuendo which obsesses Washington at the present time. As chairman of two investigating committees and a member of a third, he commented that he thought he could speak with authority on the low character of some of the testimony that has been taken in these investigations. Incidentally, the toastmaster made a good deal of humor at the expense of the Senator on the character of the testimony and the personnel of the investigating committees, which the Senator seemed thoroughly to enjoy.

The Senator spoke pointedly about the tax situation. He said that six states pay 62 per cent of the entire burden of the federal government, and that obviously all representatives of the less populous states vigorously oppose any measure that would tend to bring about a more equitable distribution of the taxes. He said the dollar-for-dollar plan of building roads, whereby the federal government contributes a dollar for each dollar the state puts in, looks upon its face to be very meritorious. Actually, however, it means that the six heavily taxed states pay a large share in the road programs of other states. As he put it, it makes the progressive states pay for the backward ones. For example, New Hampshire pays a federal tax of $23 per capita, but on the dollar-for-dollar program it gets back 89 cents in federal money, and in order to get that it has to tax itself practically another 89 cents. Another state which draws $3.25 per capita of the federal funds pays $8,000,000 less than does New Hampshire, and another draws $1.86 and pays only one-half the federal tax that New Hampshire does.



Governor Channing H. Cox made a brief but stirring speech to the effect that our republic, with all its faults, is the most glorious success of any form of government that has ever been set up.

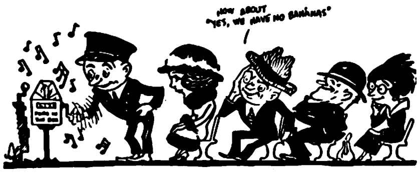
Mayor James M. Curley had to disappoint the convention at the last minute, but he was ably represented by Mark Sullivan, who extended the welcome of the city. The last speaker on the program was the Rev. William Porter Niles, essayist.

### NEW OFFICERS ELECTED

The following officers were elected for the ensuing year:

President, T. H. Kendrigan, superintendent and claim agent Manchester Street Railway, Manchester, N. H.

Vice-presidents: For Massachusetts, L. D. Pellissier, Holyoke; Connecticut, J. K. Punderford, New Haven; New Hampshire, L. E. Lynde, Dover; Vermont, T. B. Jones, Burlington; Maine, Fred R. Gordon, Portland; Rhode Island, Edward A. Brown, Newport.


HOW ABOUT "YES, WE HAVE NO BANANAS"

*Suggestion 2,396,453. A music box attached to the "coin catcher" to keep the cash customers contented.*

Secretary: John W. Belling, Boston, Mass.

Treasurer: Fred F. Stockwell, Cambridge, Mass.

Executive Committee: Ralph D. Hood, Charles H. Wood, W. W. Field, Howard F. Fritch, George H. Martin, George H. McFee and H. M. Flanders.

## Southwestern to Have Good Railway Program

THE Southwestern Public Service Association will hold its annual convention at New Orleans, La., on April 22-25, at the Roosevelt Hotel. The program this year contains an unusual number of papers and discussions of interest to electric railway men. The program also comprises sessions and subjects for the gas and electric men. Of particular interest to the railway men are the following items on the program:

### TUESDAY MORNING

"Prone Pressure Method of Resuscitation," by Samuel H. Reid, Bureau of Safety, Chicago.

### WEDNESDAY MORNING

"Why Street Car Rides Vary Widely in Cost in Different Cities," by J. W. Welsh, executive secretary American Electric Railway Association, New York.

"Proper Financial Structure of a Public Utility Company," by W. C. Lang, assistant comptroller Electric Bond & Share Company, New York.

### WEDNESDAY AFTERNOON

"The Relations of the American Electric Railway Association to the Regional Association," by J. W. Welsh, executive secretary American Electric Railway Association.

"Operation and Maintenance as Basis of Public Relations," by A. B. Paterson, vice-president New Orleans Public Service, Inc.

"Education and Development of Employees with Reference to an Understanding of the Fundamentals of the Railway Business," by G. H. Clifford, vice-president Northern Texas Traction Company, Fort Worth.

### THURSDAY MORNING

"The Street Railways and the Public," by W. H. Sawyer, president East St. Louis & Suburban Railway, East St. Louis, Ill.

"Employee Training for Better Public Relations," by S. M. Kennedy, vice-president Southern California Edison Company, Los Angeles.

"A Giant Awakened," by Alexander Forward, secretary-manager American Gas Association, New York.

### THURSDAY AFTERNOON

**Transportation Division**

"Training of Inspectors," by W. W. Holden, superintendent of transportation San Antonio Public Service Company.

"Schedule Making and Organization of the Schedule Department," by T. H. Owens, Dallas Railway.

"The Relation of Types of Cars to Character of Service," by R. Meriwether, general manager Dallas Railway.

"Accident Prevention," by W. A. Robertson, superintendent of railways, Eastern Texas Electric Company.

**Public Relations Division**

"Railway Advertising," by C. J. Crampton, Dallas Railway.

"Participation in Public Activities," by W. E. Wood, manager Houston Electric Company.

**Mechanical Division**

"Use of Electric and Acetylene Welding in Shops," by Walter Silvus, Texas Electric Railway, Dallas.

"Shop Organization and Practice in Connection with Maintenance and Extension of

Equipment," by V. W. Berry, general superintendent Northern Texas Traction Company, Fort Worth.

"Rapid Wear of Carbon Brushes on Ventilated Motors," by F. J. Bennett, Houston Electric Company.

**Maintenance of Way Division**

"Various Types of Track Construction with Reference to Costs of Paving," by R. G. Tabor, Northern Texas Traction Company, Fort Worth.

"Types of Joints and Methods of Installation," by G. W. Smith, San Antonio Public Service Company; R. B. Fehr, Rail Welding & Bonding Company, Cleveland, and others.

"Creosoting and Other Methods of Preserving Ties and Poles," by E. E. Boehme, International Creosote & Construction Company; J. P. Logan, National Lumber & Creosote Company, and others.

"Cast Steel and Alloy Steel vs. Manganese for Special Work," by E. B. Ledwisle, Lorain Steel Company; James H. Budd, Bethlehem Steel Company, and others.

"Crossings—Type, Paving and Foundation," by B. H. Taylor, Houston Electric Company.

**Accounting Division**

"Use of Machines in Accounting Work," by F. J. Gannon, assistant treasurer Northern Texas Traction Company, Fort Worth.

"Obtaining Car Mileage," by W. R. Burns, Dallas Railway.

"Transportation Pay Roll Accounting," by A. D. Dufour, New Orleans Public Service, Inc.

FRIDAY MORNING

"Building in the Public Mind the True Conception of Utilities," by E. F. Wickwire, vice-president Ohio Brass Company, Mansfield, Ohio.

"Relation of Bus Operation to Street Railways and the Outlook for the Future," by W. B. Tuttle, president San Antonio Public Service Company.

"Methods Employed for Elimination of Car Pull-Ins and Relation to Service," by R. M. O'Brien, New Orleans.

# American Association News

## Legislative Activities in Washington

### American Association Committee on National Relations Busy Presenting Point of View of Electric Lines on Three New Bills—Suggestions Made for Guidance of I. C. C. on Application of Section 15a

THE committee on national relations of the American Electric Railway Association made an appearance at a hearing on March 29 before the Senate interstate commerce committee on the Howell railway labor bill, S. 2646. In a word, this bill provides that the present wages and present working conditions shall continue in effect. If a revision is desired, thirty days' notice must be given to one of the several boards that would be set up by the bill, and can be made only upon approval by this board. The electric railways are specifically included in the bill and its effect would be to bring adjustments under a national board. It might result in forcing electric railway employees into the steam railroad brotherhoods.

Charles L. Henry, chairman of the national relations committee; Frank Karr, Pacific Electric Company; R. R. Bradley, Chicago, North Shore & Milwaukee Railroad, and W. V. Hill, San Francisco, appeared for the electric railways. A short but specific statement setting forth the position of the electric railways with respect to such a proposal was presented by Mr. Karr. Just after he concluded, D. R. Richberg, counsel for the organized steam railroad employees, addressed the Senate committee and said that the proponents of this bill did not desire that the electric railways should be included, if such railways and their employees did not so desire; that in the light of former legislation they had concluded that it was proper to put the electric railways in, but the latter might be removed from the bill without any opposition on the part of those pressing this bill for passage.

#### HEARING ON STEEL CAR PROPOSAL

Representatives of the association made an appearance in Washington on March 20 before the Senate interstate commerce committee on the proposed Dennison bill, H. R. 4107. The Dennison bill is known as one "for the protection of persons employed on railway baggage cars and railway express cars." It has been substituted in the House for Senate bill S. 863. It provides that carriers, specifically including interurban and suburban railway companies irrespective of whether steam or electrically operated, shall use only baggage and express cars after July 1, 1926, which are constructed of steel or have a steel underframe, and that after this date all new cars must be constructed of steel, subject to the approval of the Interstate Commerce Commission.

The bill is designed primarily to apply to steam carriers, but the committee on national relations felt that the electric railways should appear and point out that the conditions it was sought to correct did not exist in the electric railway field. At the hearing Charles L. Henry made a short statement for the electric railways and introduced H. A. Mitchell, vice-president and general manager San Francisco-Sacramento Railroad, Oakland, Cal., who made a statement. Others in attendance representing electric railways were Frank Karr, San Francisco; E. H. Maggard, Petaluma, Cal., and W. V. Hill, San Francisco. The committee finally indicated that the proposition to require all steel cars in baggage and express service would be confined to Class A steam roads, and main line service in particular.

#### ANOTHER SIMILAR BILL INTRODUCED

While it appears that the House bill referred to above will not affect the electric lines, another bill, S. 1499, has been reported to the Senate without a hearing in committee, which involves the electric railways. This bill passed the Senate with but slight opposition on March 28. It prohibits the use of wooden cars. Senator Harris, its author, was asked by Senator King whether it would prohibit the operation of wooden cars on interurbans. Senator Harris replied that it would not, but in answer to another question he stated it would not permit electric lines to use wooden cars between steel cars. This would prohibit electric lines from operating a wooden car in the same train with a steel or a steel underframe car.

#### RULES SUGGESTED AS TO APPLICATION OF SECTION 15A

At the close of the hearing on March 19 before the Interstate Commerce Commission in Washington on whether Section 15a of the interstate commerce act should be applied to interurban railways (see ELECTRIC RAILWAY JOURNAL for March 29, page 511) Commissioner Potter requested J. V. Norman, counsel for the Interstate Public Service Company, to endeavor to obtain the approval of as large a number of the interested parties as possible to general rules which would automatically place many carriers without Section 15a. The idea was that such rules would relieve the commission from the individual consideration of many carriers. During the hearing Mr. Norman had proposed certain rules in his testimony. He stated that these rules were to be considered as general rules which would exclude from further consideration a large number of companies, but that it was not to be understood that companies not excluded thereby were inferentially within the act.

After the hearing was concluded, a meeting was held of all present and there was a long discussion of rules that might be proposed. All those present agreed on Rule 1, as stated below, as a proper one, but many of them were unwilling to subscribe to it as a proposal coming from the electric roads for fear that the commission might receive the impression that the companies not excluded by the application of the rule were inferentially within the provisions of the act.

No agreement whatever could be reached on a proposed second rule, as stated below, principally because the meeting could not agree on the phraseology, but also because such a rule might be so applied as to exclude from the operation of the act some companies which desired to come within its operation.

The two rules discussed were as follows:

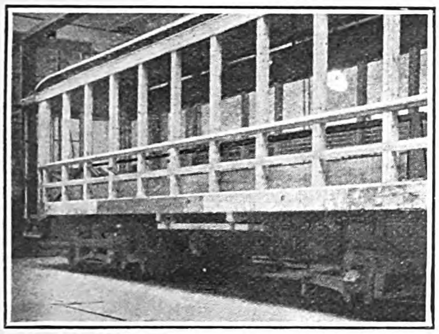
> Rule 1. No electric interurban railway is "engaged in the general transportation of freight" within the language of Section 15a unless it exchanges freight traffic with steam carriers under through routes and joint rates.
>
> Rule 2. An electric interurban railway which interchanges freight traffic with steam carriers, as provided in Rule 1 above, is not within the provision of Section 15a unless it holds itself out to handle the same general classes of freight in the same general manner as steam carriers.

In view of the considerations already stated, the meeting decided not to propose any rules to the commission, but authorized Mr. Norman to convey to it the information that while all agreed that Rule 1 is a proper rule they were unwilling to propose it for the reasons stated above.

# Maintenance of Equipment

## Truss Braces Rebuilt Car

AN UNUSUAL method of bracing the car body has been adopted by the Holyoke Street Railway in rebuilding for passenger service a mail car which formerly operated between Northampton and Springfield. Two triangular iron castings are used on each side as vertical compression members of a truss, with a steel strip as the tension member. One casting is placed beside the second window post from each end of the car. A steel strip ⅜ in. thick and 1½ in. wide is fastened beneath the frame at the corner post and runs up over one triangular support, continues parallel to the floor of the car, then over a similar support at the opposite end, and down under the other platform floor. Two trusses of this sort are used in this reconstruction, one on each side of the car.



A Truss on Each Side of the Car Prevents Platforms Sagging

## New Platforms Added to Old Cars

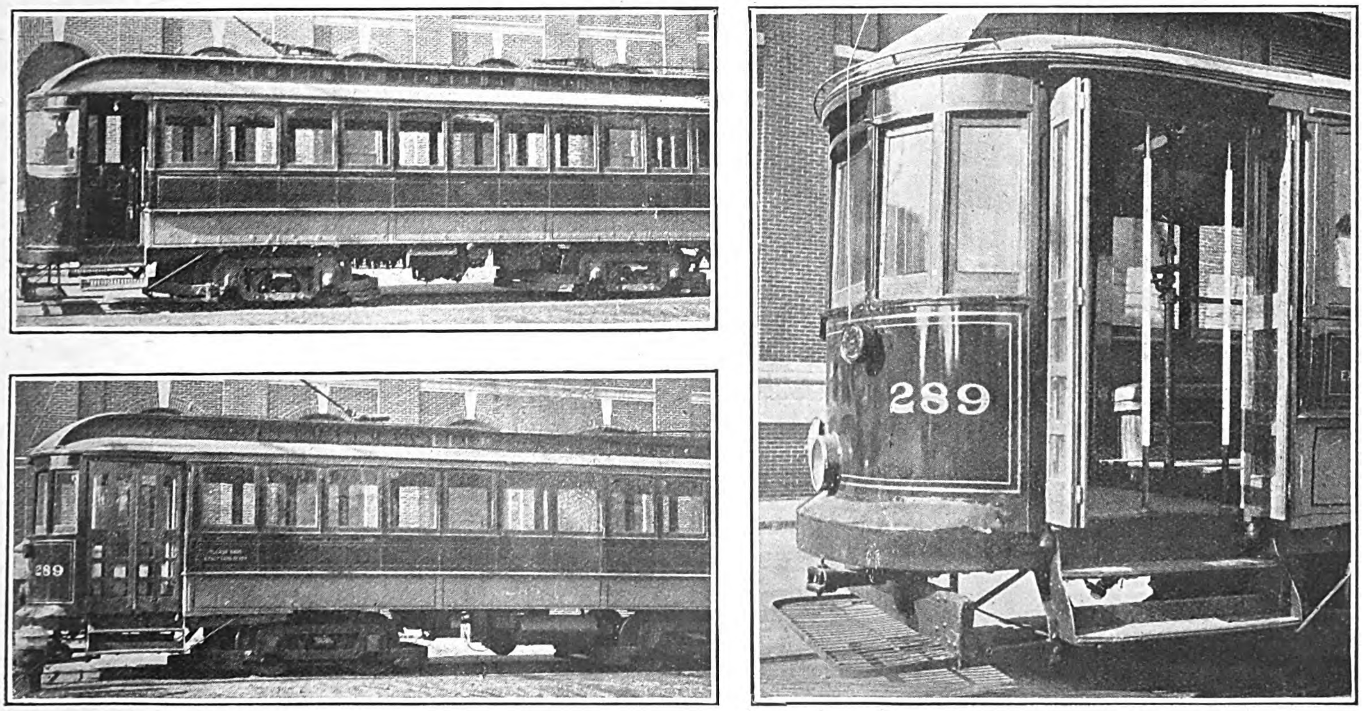
IN THE conversion of some of its older cars to the prepayment type the Union Street Railway, New Bedford, Mass., has extended the car platforms. This was done by making a clean transverse cut at the bulkhead and removing the platform. The old platform and dash were used again in the rebuilt car, an 18-in. section being inserted at the bulkhead. The platform knees on these cars are of wood, reinforced on either side by steel plates. Extensions to the plates were bolted on and an 18-in. wood block inserted to fill the hole.

The end bulkheads were taken out to facilitate the use of the prepayment plan on this type of car. Convenient grab handles were placed in the center of the double doorway and at both sides. These are located inside the folding doors so as to discourage passengers attempting to board the car after the doors have been closed. The doors are manually operated, but are interlocked with a line switch in the main motor circuit. Another safety feature which was introduced when the cars were rebuilt was the use of sloping steel hoods on the end bumpers.

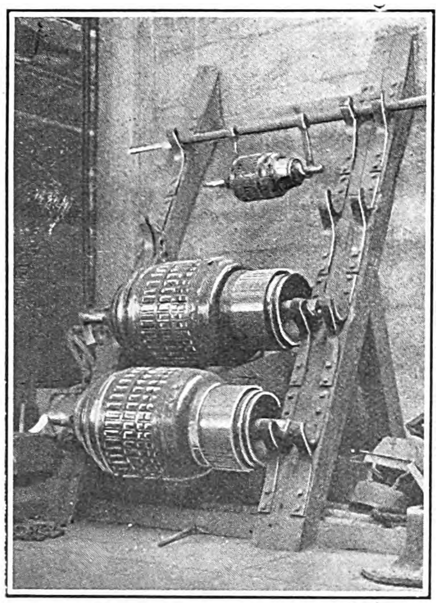
The weight of these cars was slightly less than 19 tons before rebuilding. The reconstruction added only a small amount to the weight. A modern type car has been acquired at approximately 10 per cent of the sum that new cars would have cost.

## Handy Method for Supporting Short Armatures

WHERE armature racks are constructed for supporting railway motor armatures, which are all of approximately the same length, difficulty is sometimes experienced in providing supports for short armatures such as those for compressor motors. The accompanying illustra-



An 18-In. Section Was Added to the Platform to Fit New Bedford Car for Use on the Prepayment Plan. At Right, Enameled Stanchions Placed to Aid Ingress and Egress and Divide Passenger Streams

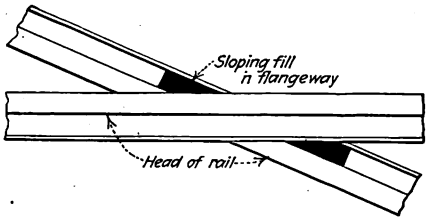


Built-In Armature Rack with Provisions for Supporting Short Armatures

tion shows an armature rack in the shops of the Philadelphia & Western Railway, Norristown, Pa. At the top is a short armature which is supported by hooks from a shaft extending over the supports ordinarily used for the longer armature shafts. By this method the short armatures can be stored in the rack where the larger type armatures from railway motors are placed.

## Special Crossover Preserves Continuous Through-Rail

AN UNUSUAL type of crossover has been made by the Springfield Street Railway, Springfield, Mass., for use in front of its carhouse at Main and Carew Streets. It is frequently desired to cross cars over from one track to the other at this point, but there is also through service on a comparatively short headway and it was thought undesirable to break the through-rail. To meet this situation a special crossover was made by the track department. The main line rail was left continuous and the crossing rail was welded to it. Grooved rail was used in both cases and a sloping fill was welded into the flangeway of the broken rail in order to facilitate the passage of wheels over the continuous rail.



The Sloping Fill of Welding Metal Facilitates the Passage of Wheels Over the Continuous Rail of This Home-Made Frog

## Painted Paths Promote Safety

IN THE shops of the Worcester Consolidated Street Railway, Worcester, Mass., an overhead monorail system equipped with chain hoists is used for transporting heavy material. This was described in the JOURNAL for March 22. The routes by which this material is moved are therefore definitely established, and have been marked out on the floor. A broad white stripe on each side indicates the limits of the passageway which must be kept clear for the movement of material. Nothing is permitted to be stored in this area. The passageway is also available for individuals walking from one place to another, movement of material in hand trucks, etc. The white lines are repainted about once every two weeks so that they are always distinct.

It has been found that the cost of thus marking the passageways has been more than repaid by reduction in the number of accidents due to persons, or material in transit, colliding with material stored on the floor.

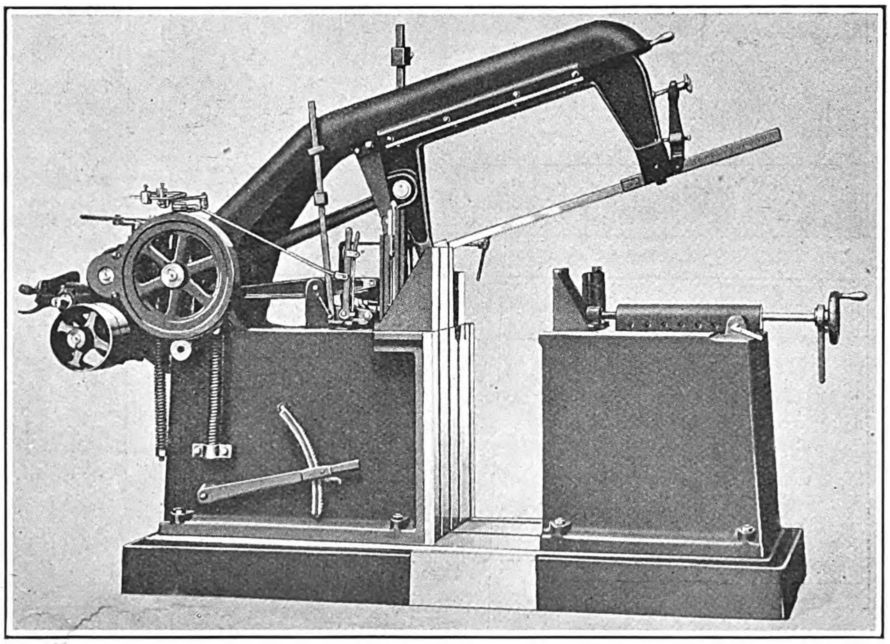
# New Equipment Available

## Power Hack Saw with Gap

A NEW type of power hack-saw, which the manufacturer calls a "Gap-Saw," has just been announced by the Peerless Machine Company, Racine, Wis. As in the case of a gap-lathe, when the gap is closed the saw can be used for ordinary purposes. When the gap is open, it has an excess work holding capacity of 24 in. in height and 16 in. in width.

The work can either be clamped to the finished vertical face on the bed, where four "T" slots are provided for clamping purposes, or the work can be clamped directly to the base, where three "T" slots will give ample clamping convenience. The base has a water-trough extending entirely around its perimeter, which carries the coolant back into a reservoir located in the rear of the base, from where a rotary geared pump circulates the coolant up into the distributing pipe. The finished pad which is opposite the gap and which is located on each side of the base is for the convenience of the operator when locating work which is clamped directly to the base. The left-hand edge of the bed is also finished for measuring convenience purposes.

A piece of steel 16 in. x 26 in. can be sawed in two by sawing through 13 in. and then meeting the cut by



Power Hack Saw with Gap Open

GENERAL SPECIFICATIONS FOR POWER HACK SAW

| | |
|---|---|
| Capacity of machine on ordinary work | 13 in. x 16 in. |
| Capacity of gap-work | 16 in. x 37 in. |
| Length of blade | 14 in. to 24 in. |
| Length of machine | 80 in. |
| Width of machine | 30 in. |
| Weight of machine, approx. | 3,000 lb. |
| Distance from floor to top of base | 6 in. |
| Distance from floor to top of table | 30 in. |
| Strokes per minute of saw frame | 125 |

turning the piece half way over. This work is often encountered in the railroad shop, the drop-forge shop and the structural steel yards. Often hammered forgings such as are machined up into crank-shafts can be blocked out prior to the machining operations.

The head lifts up on each return stroke and when the blade comes to the bottom of the cut, the feed is automatically disengaged and the head lifted up to its uppermost position through balance springs. Blade pressure or feed can also be varied at will by raising or lowering the ratchet lever shown on the side of the head.

The machine shown in the cut is equipped with the standard six-speed stroke mechanism which is used on the Peerless high-speed saws when the materials require different cutting speeds. Either this attachment or the usual 2-hp. motor, or both, can be furnished with the machine. The machine can also be furnished without the six-speed gear box or motor and bracket.

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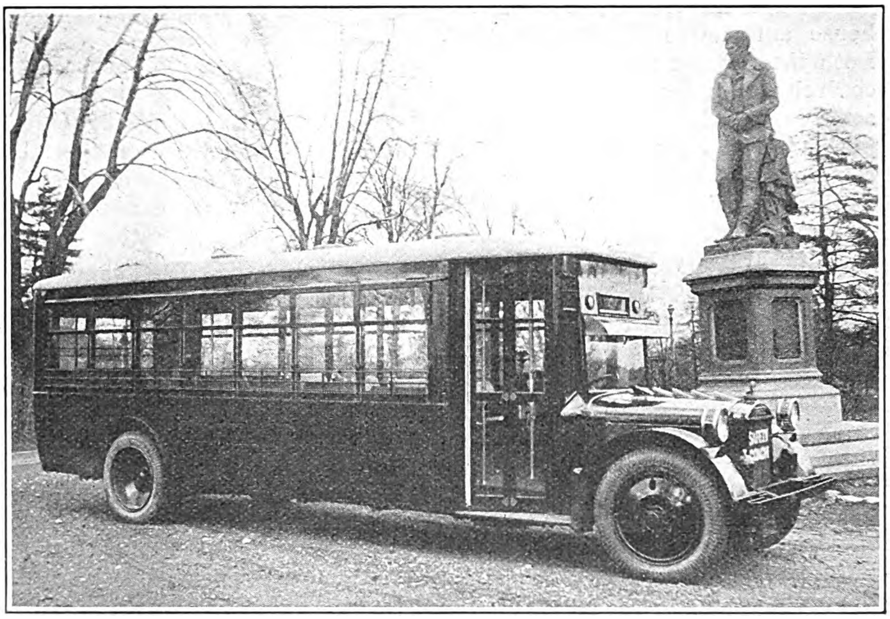


Birney Design Body Built by American Car Company on Fageol Chassis

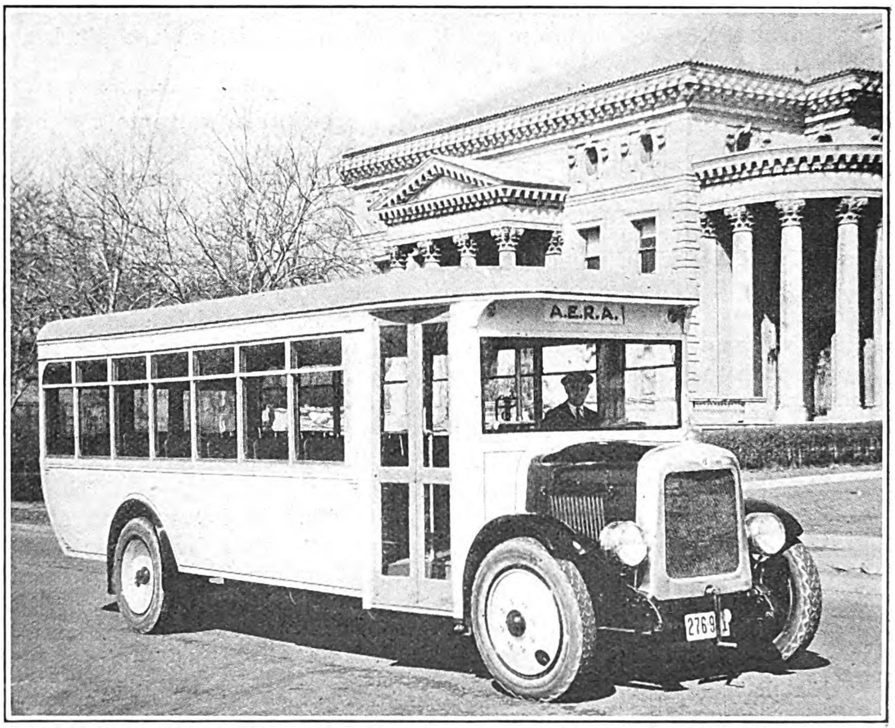
## Birney Safety Buses Exhibited at St. Louis

TWO buses designed particularly to meet the needs of electric railways were exhibited at the recent meeting of the American Electric Railway Association at St. Louis. Working on the principle that the safety devices which have been so successfully used on one-man street cars are even more desirable on a one-man bus which has to be maneuvered through vehicular traffic, and that any device which will relieve the operator of some of his duties will increase the safety of operation, an interesting arrangement of pneumatic safety devices and auxiliary apparatus has been developed. This work is the result of a study of bus operation by the bus committee of the Stone & Webster properties, of which C. O. Birney is designing engineer, working in co-operation with the Westinghouse Traction Brake Company, St. Louis Pneumatic Devices Company, American Car Company, St. Louis Car Company, Fageol Motors Company and the Yellow Coach Manufacturing Company.

One of the buses has a body constructed by the St. Louis Car Company, mounted on a Yellow Coach chassis, while the other has a body built by the American Car Company, mounted on a Fageol chassis. Low hung chassis and pleasing lines feature both vehicles. The low step heights, together with liberal aisle space, insure convenient and rapid interchange of passengers in city service. Each bus has a seating capacity of 29. The body constructed by the American Car Company has a combination of cross and longitudinal seats upholstered in leather, the longitudinal seats being used over the rear wheel housings adjacent to the service door at the front. In the St. Louis body the cross-seat arrangement is used throughout and the seats are upholstered in green frieze plush.

### COMBINED ACCELERATOR AND BRAKE CONTROL

Compressed air for the brake system and the pneumatic devices is



Birney Design Body Built by St. Louis Car Company on Yellow Coach Chassis obtained from a 3-cu.ft. Westinghouse automotive type compressor. Both the throttle and the air brake control valves are operated from a common pedal, which, when it is pushed down from the neutral position, opens the carburetor throttle, and when it is released tilts up beyond the neutral position to operate the air brake valve. The neutral position is clearly defined by a compound spring arrangement which is installed to facilitate the shifting of gears.

On the side of the foot pedal is a latch so that it can be depressed by the foot of the operator to engage a notch in the supporting casting and hold the pedal in full brake application position after this position has been reached. This latch controls the emergency or "deadman" feature of the device. If the pedal is released from any position less than full service brake application position, it immediately springs beyond the point where the latch will engage in its notch to a position in which not only a full service brake application is made, but also the engine throttle is closed to idling position and the air-operated service door is balanced so that it can be pushed open by hand.

Graduated control of the air brake is obtained by the use of an automatic lap valve with a reducing action which gives a predetermined brake application pressure for any given position of the brake valve. In any intermediate position, a constant brake chamber pressure is retained corresponding to this position, until the valve is moved to give a higher or lower pressure.

### ARRANGEMENT OF PNEUMATIC CONTROL

A reservoir pressure of 75 lb. per square inch is carried. Two pipes lead from the main reservoir, one directly to the brake control valve and another to a reducing valve which allows a pressure of 50 lb. per square inch to the door control valve mounted on the steering wheel column. The brake valve controlled from the foot pedal allows air to flow to the brake chambers in graduated amounts as the pedal is allowed to tilt above the neutral position, and conversely, as the pedal is depressed from full brake application position, the brake chamber pressure is gradually reduced to zero. At the neutral position the brake chamber pressure is completely released, in which position the brake control valve connects the brake chamber pipe to atmosphere.

A center port in the upper portion of the brake valve body is connected directly to the door closing port of the door control valve on the steering wheel column. In all positions of the brake valve between neutral and full brake application position this port registers with a pipe leading directly to the door closing side of the door engine, allowing air to be transmitted through the reducing valve to the door control valve, thence to the center port of the brake valve and from there to the door closing side of the engine.

In the "deadman" or emergency position of the treadle the air connection through the brake valve is cut off and the door closing side of the door engine is vented directly to atmosphere, thus allowing the door to be pushed open by hand in the same way as is accomplished on the Birney safety car when an emergency application of the air brakes takes place.

GENERAL DIMENSIONS

Birney Safety Buses

| | | |
|---|---|---|
| Body | American | St. Louis |
| Chassis | Fageol | Yellow Coach "2" |
| Wheelbase | 218 in. | 193½ in. |
| Length over all | 26 ft., 2 9/16 in. | 25 ft., 1 in. |
| Length over body corner posts | 18 ft., 10¼ in. | 21 ft., 0 in. |
| Width at belt rail | 7 ft., 6 in. | 7 ft., 6 in. |
| Width at side sills | 6 ft., 0¼ in. | 6 ft., 8 in. |
| Height from road over roof | 9 ft., 0 in. (over ventilators | 8 ft., 10 in. |
| Height from road to top of floor | 1 ft., 10 in. at door<br>2 ft., 3 in. rear end | 2 ft., 2⅜ in. |
| Height from floor to headlining in center | | 6 ft., 3⅝ in. |
| Height from floor to window sill | 1 ft., 11½ in. | 2 ft., 1¾ in. |
| Seating capacity | 29 passengers | 29 passengers |
| Seat centers | 2 ft., 5 in. | 2 ft., 5 in. |
| Post centers | 2 ft., 5 in. | 2 ft., 5 in. |
| Aisle width at cushion | 1 ft., 8 in. | 1 ft., 8 in. |
| Service door opening in clear | 1 ft., 11 in. | 2 ft., 3½ in. |
| Height from road to step | 1 ft., 3 in. | 1 ft., 4 in. |

The air in the brake control pipe from the brake valve to the brake chambers passes through an automatic three-way valve before it reaches the chambers. The door opening pipe leading from the door control valve on the steering column is connected to the door opening side of the engine and is also continued through a tee to this same three-way valve. A sliding check in the three-way valve, in its normal position, closes the port leading from the door opening pipe and allows air to flow from the brake valve to the brake chambers. If, however, an attempt is made to open the service door by admitting air to the door opening side of the engine before a full brake application is made, the pressure immediately forces over the slide in the three-way valve and allows air to flow directly to the brake chambers, thus applying the brakes.

An additional port is provided in the upper portion of the brake valve to which pressure is admitted in the emergency position. This port is available for operating any auxiliary pressure device on the vehicle which it may be desirable to bring into action when an emergency application occurs. If not required, this additional port can be plugged so as to be inoperative.

### PNEUMATICALLY OPERATED FARE BOX

Each bus is equipped with a Johnson fare box, which is mounted on the vertical stanchion immediately to the right of the driver. An extremely simple four-cylinder pneumatic engine, mounted in an aluminum case fastened to the bottom of the box, drives the registering mechanism by a light chain inclosed in an aluminum housing on the side of the box. This engine was developed by the St. Louis Pneumatic Devices Company and the arrangement is such that the entire box with its driving mechanism can readily be removed from the supporting stanchion. When this is done the air connections are automatically broken, and are likewise automatically remade when the box is replaced in its socket.

The design and construction of both bus bodies is very similar to that of the single-truck Birney type of one-man safety car. Continuous tee-posts are used for the side posts and roof supports, and many other features of the body structure are likewise similar to the construction used in the Birney car. In the American body wood lower side sash reinforced with brass wearing channels are used, while the St. Louis body is equipped with Curtain Supply Company's brass sash. The general dimensions of the two buses are shown in the accompanying tabulation.

# The News of the Industry

## Everett Results Disappointing

### $14,780 Deficit in 1923 There Under Five-Cent Fare with Bus Operation

Everett, Wash., a city of 30,000, in which the local railway, the Pacific Northwest Traction Company, substituted buses for street cars except for one 5-mile line, is going to lose its 5-cent fare. After a long conference between city officials and officers of the railway, the proposed discontinuance of transfers on the company's bus lines has been averted by an increase in fare from 5 cents to 6¼ cents.

### TROUBLE DATES BACK TO 1917

Sentiment against abolition of transfers arose at a conference attended by representatives of various civic bodies and George Newell, local manager of the company at Everett, agreed to withdraw his application to the Department of Public Works for this permit. Mr. Newell explained that the company automatically reverts to the 6¼-cent fare on April 1, and that the 5-cent fare, which has prevailed for sixteen months, had been merely the result of an agreement between the old City Council and the traction company for an experimental period.

The trials of the railway at Everett date back to 1917. Cost really reached the highest point in June, 1920. The railway was obliged to raise the pay of employees and at the beginning of 1921 employees were receiving considerably above 100 per cent more wages than before the war.

But that is only part of the story. Early in 1922 the company was confronted with additional problems in the way of rebuilding tracks and paving streets, and with an expenditure of between $3,000,000 and $4,000,000 in the next five years. As it could see no way of raising this amount or of earning a return on it the company decided to take its problems up with the City Commissioners with a view to working out a system of city transportation that would be adequate and that it could finance. As a result the bus was substituted for the railway.

### FIVE-CENT FARE AN EXPERIMENT

During the negotiations with the City Commissioners for an amended franchise, the matter of fares was discussed and the commissioners were of the opinion that the company should try out a 5-cent fare with transfer privileges. The company agreed to give the 5-cent fare a fair trial in the hope that revenues might be sufficient to operate the system. That fare went into effect on Dec. 1, 1922.

The result was disappointing, however, for the company took in $6,450 less in 1923 with a 5-cent fare in effect than it did in 1922 when 6¼ cents was the rate for eleven months and 5 cents the rate for one month. On the other hand, expenses increased $19,020, not including depreciation on the buses. Including depreciation on the buses, expenses increased $34,573. When books were closed for the year the company lacked $3,180 of funds sufficient to pay operating expenses, depreciation on the buses and taxes, and money had to be borrowed with which to pay taxes. The deficit for the year 1923, including a reasonable depreciation on the remaining track and electric cars and other operating property in connection with the system, was $14,780.

Still further to aggravate this situation, gasoline took a sharp advance and city operators demanded higher pay. Finally an arbitration board granted the men a substantial increase in pay and recommended the company to the mercy of its citizens and car riders. This, however, placed the company in the position of having to carry out the award without sufficient funds to do so. The concern of the company was to pay legitimate expenses and give the stockholders, who have not received any dividends for the past nine years, some little return on the money invested.

### COMPANY ASKS ONLY A SQUARE DEAL

About Jan. 20 there was filed with the department of public works at Olympia a temporary tariff extending the 5-cent fare until March 31 of this year. The company never withdrew regular tariff No. 6, under which it collected the 6¼-cent fare, but simply filed an experimental supplementary tariff every three months, keeping the 5-cent fare in effect. Due to the fact that it did not receive sufficient revenue last year with which to pay expenses and taxes, and anticipating increased expenditures in the way of higher wages this year, the company filed with the department of public works, to take effect April 1, an experimental tariff to run for three months eliminating transfer privileges except from the Lowell-Smelter line to the bayside cars.

The company, in turn, was informed by the department of public works that it would allow this to go into effect unless a protest was filed by the citizens of the community, in which case it would not allow it to go into effect, but would give the company and all concerned a hearing. There matters stand.

The company concedes the right of the people, who pay the fare and support the road, to have some voice in how these fares should be paid. All the company asks is that the fares shall be sufficient to allow it to pay the employees a living wage and to give the company something near a reasonable return.

## Forty-two Buses for Akron

### Northern Ohio Company Has Bought $300,000 of Vehicles for City and Interurban Service

The Northern Ohio Traction & Light Company, Akron, has purchased forty-two new buses, of which twenty-eight will be used in Akron city and the remaining fourteen will be used in the Akron-Cleveland interurban service. The buses represent an investment in excess of $300,000.

The interurban buses will be of the de luxe chair car type. They are White chassis with Bender bodies. Each seats 20 passengers. It is planned to maintain a fifteen-minute service between the two cities. During the last thirty days a 75-cent rate to Cleveland on Mondays, Wednesdays and Fridays has so increased travel that the regular thirty-minute service has proved inadequate.

For the city service ten Whites seating twenty-five each, six Macks seating twenty-five each, six Reos seating twenty each and six Masons seating twenty each have been purchased. Some of the bodies are being built by The G. C. Kuhlman Car Company. All bodies are steel and of the same type as the twenty-four buses now used by the company in its Akron city service.

The new routes to be served include extending the Akron crosstown line east to the Martha Avenue loop; Maple Street line west to Hawkins Avenue; new line from car line terminal on Wooster to West South Street; South Main from Steiner Avenue to Firestone Boulevard.

The buses will give service to sections of Akron which now have little or no transportation facilities.

## Buses for Bridgeport in Co-ordination with Railway

The Connecticut Company believes it has made initial overtures to the community at Bridgeport in the matter of bus service upon routes not served. As a result it will await expressions from the community as to the desirability and acceptability of the proposed auxiliary service.

The chief factor in the consideration is one of finance. Less important is the matter of securing the bus equipment which it is conceded can be taken care of within a reasonable time. President Storrs has pointed out that the Connecticut Company is committed to a policy of extending bus service.

The commission has now before it the proposition of passing upon the petitions of local individuals and corporations for the operation of bus lines and at the same time the proposal of the Connecticut Company to start lines. Upon the decision of the commission will depend to a great extent the time within which the bus service will be established.

Mr. Storrs outlined what the Connecticut Company recognizes as needed routes in Bridgeport, as follows:

1. Iranistan Avenue as far as the bathing beach in summer and as far as the park in other periods of the year.
2. Through Howard Avenue and Spruce Street to serve the industries located in the West End as well as the industrial workers who have their homes in this territory.
3. Out Madison Avenue over routes as now served by jitneys and further beyond the jitney route on Madison Avenue itself if occasion requires.
4. From the industrial territory on the southerly side of the New York, New Haven & Hartford Railroad tracks in East Bridgeport across the railroad tracks and through the industrial settlement on the northerly side of the tracks as far as the General Electric plant.

Mr. Storrs holds to the opinion that it is only through such co-ordinated service that the city of Bridgeport can obtain a thoroughly efficient transportation medium operated for the benefit of all of the people of the city at the lowest possible charge.

## Storm in East Hampers Traffic

Simultaneously with the preparation of spring and summer schedules for electric railways came on April 1 a wind, snow, sleet, thunder and lightning storm, the only real blizzard on the Atlantic Coast during this winter. Four deaths and many injuries were reported. Heavy traffic congestion, blocks, tie-ups, isolation of towns and a cost to New York City of $250,000 were the minor results. Eight inches of snow fell in New York City. In addition to the "L" and train service being generally hampered there were traffic delays on the Long Island road, the Brooklyn-Manhattan Transit lines, the New York & Queens County Railway and the municipal cars on Staten Island. A serious accident occurred when a B.-M. T. shuttle train and an Interborough elevated train crashed in Long Island City. In this collision one person was killed and thirteen injured.

## Mr. Turner Retained at Pittsburgh

The Council of Pittsburgh has confirmed the appointment by the Mayor of Daniel L. Turner, New York, to be chief engineer of the survey to be made of transit and traffic conditions in Pittsburgh. An advisory committee consisting of Ralph S. Rainsford, chief engineer of the Pittsburgh Railways; L. W. Monteverde, representing the real estate board, Henry Tranter, the Civic Club and Allied Boards of Trade; George S. Davison, the Chamber of Commerce and planning commission and W. M. Jacoby the Retail Merchants' Association, was named and confirmed at the same time.

With this organization subway and other solutions of traffic problems is left for consummation of a plan. Funds amounting to $60,000 taken from the $6,000,000 authorization for the downtown subway will be made available for the study or survey.

## Bus Operation in Prospect in Albany District

The United Traction Company, serving the cities of Albany, Rensselaer, Watervliet, Troy and Cohoes, N. Y., is planning to put trackless trolleys into operation in Cohoes and the city of Rensselaer on certain lines which act as feeders to the main arteries of travel.

In the city of Rensselaer, situated immediately opposite Albany on the east side of the Hudson River, application was made to the Common Council on April 1 for permission to substitute buses on one of its city lines. A public hearing is to be had on the application on April 15.

Plans to tear up the Cohoes belt line tracks and supplant the street cars with trackless trolleys, the work probably to be completed before summer is over, were disclosed last week by officials of the United Traction Company. It is expected, if the Cohoes plan proves a success, that other "feeder" lines in the Capitol district may be replaced by "pneumatic-tired trolleys."

The company must first obtain permission from the Public Service Commission to install the new cars and then must convince the Cohoes Common Council that the move will be a wise one. After arrangements with the city have been completed about three months will be necessary to make the change.

Trackage to be abandoned is about 2.3 miles long. It will cost the company about $74,000 to remove the tracks and repave the street, Ernest Murphy, general manager of the United Traction Company, told Mayor Cosgro of Cohoes.

## Northern Ohio Is Rehabilitating Mahoning Valley Line

Through passenger service between Akron and Warren and Akron and Alliance every two hours was established by the Northern Ohio Traction & Light Company on April 1. Light-weight Peter Witt cars are being used. The old cars are to be rebuilt into freight cars and trailers.

At the same time the company began the work of completely rehabilitating the Cleveland, Alliance & Mahoning Valley Railroad from Ravenna to Warren and Ravenna to Alliance. This road the company recently took over under a purchase agreement with the bondholders. All curves are to be renewed at once and 45,000 new ties placed in the roadbed. New rail will be laid in many places where the old rail was badly worn.

Connection is made at Silver Lake Junction from Alliance, Newton Falls and Warren with limited trains to Cleveland, while freight trains operate direct from these cities to Cleveland, Detroit and other cities. Freight terminals are to be increased at all points in the immediate future. The C., A. & M. V. line offers excellent freight opportunities and these are to be embraced by the Northern Ohio Traction & Light Company.

Arrangements are being made to start a thirty-minute service between Newton Falls and Warren. Weekly passes will probably be sold for use on this line.

A. C. Blinn, vice-president and general manager of the Northern Ohio Traction & Light Company, is conducting a speaking tour through the towns and cities reached by the old C., A. & M. V. lines. He is asking the co-operation of the people in bringing the road out of the chaotic condition in which it has been for several years. His appeals are meeting with splendid response.

## Ordinance Passed in Cleveland to Inquire Into City Purchase

The Council of Cleveland, Ohio, has passed an ordinance which calls for a committee of five, to work in conjunction with the street railway committee, to survey the feasibility of taking over the entire property of the Cleveland Railway, now operated under a service-at-cost arrangement. The survey is to include a report on the value of the property and recommend a means of financing the purchase.

## $4,000,000 Long Island Electrification Authorized

The Long Island Railroad announced on April 3 that the largest improvement budget in its history had been authorized by its board of directors, and that instructions had been issued to carry out the work with the least possible delay.

The budget provides among other things for the electrification of the Montauk division from Jamaica to Babylon at a cost of $4,000,000.

The date set for completion of the electrification work is May, 1925, in time for the summer schedule. The completion of this work will improve the whole operation of the railroad system, greatly reduce the transfer of passengers at Jamaica, enable the railroad to operate more trains in the congested section between Amityville and Jamaica, lessen the running time of local trains and give service similar to other electrified branches of the system.

## G. R. Van Namee Named for New York Commission

Governor Smith on March 31 transmitted to the New York State Senate the nomination of George Rivet Van Namee, Watertown, N. Y., as a member of the Public Service Commission to fill a vacancy caused by the resignation of James A. Parsons for the unexpired term of nine years.

Mr. Van Namee became a member of the Public Service Commission, Second District, upon which he served until the consolidation of the commissions under the Miller administration of 1921. He then returned to Albany as secretary to Governor Smith.

**Higher Fare Sought.**—The Indianapolis Street Railway, Indianapolis, Ind., has applied to the Public Service Commission for a 7-cent cash fare with a 6¼-cent ticket rate. A 1-cent transfer charge is also sought. The present fare is 5 cents cash and 2 cents for a transfer. Corporation Counsel Groninger recently stated that the city would insist on seventeen tickets for $1.

## Pittsburgh Men Ask Wage Conference

Business Agent John L. Nelson of Division No. 85, Amalgamated Association, representing the 3,000 motormen and conductors of the Pittsburgh Railways, has served notice that changes will be asked in the existing agreement between the company and the union. The notice is in accordance with the existing agreement, which expires at nidnight, April 30.

A note simply announcing that changes will be asked, and not going into any details on the nature of the changes—which, however, are understood to include a request for a wage increase—was handed to General Manager Fitzgerald of the railway along with a request that the changes be taken up in conference at an early date convenient to the company. This date will be fixed later.

## New York State Men Present Wage Request

The Rochester, Syracuse and Utica divisions of the Amalgamated Association, in a proposal for a new contract effective May 1, submitted to James F. Hamilton, president of the New York State Railways, seek a 70-cent hourly wage and a six-day week. More than 3,000 workers make up the three city divisions, which are carrying on joint negotiations. Contracts, however, are made separately with the three unions.

The scale now in effect went into force last May. It provides as follows: 51 cents for the first three months, 53 cents for the next nine months and after one year 55 cents an hour. An increase of 5 cents an hour was granted last year. In the proposal just submitted, the men ask a scale of 66, 68 and 70 cents and a 10-cent increase over those amounts for operators of one-man cars.

## Unusual Agreement Effected

An agreement has been made between A. K. Ellis, general manager of the Wisconsin Traction, Light, Heat & Power Company, and Olaf M. Lundquist, owner of the Inter-City Transportation Company, Inc., whereby the traction company will take over the motor bus business of this company, which has been furnishing competitive bus service parallel to the interurban line in Appleton, Menasha and Neenah. Mr. Lundquist, formerly owner of the Inter-City line, has been placed in charge of the new department due to his bus operating experience and close touch with local bus conditions.

## Wages Advanced in Atlanta Three Cents an Hour

The arbitration board called to settle the wage dispute between the Georgia Railway & Power Company, Atlanta, Ga., and its railway employees has decided on an advance of 3 cents an hour. The company announced that the amount would be paid. Under the new schedule of wage rates, effective as of Jan. 1, 1924, employees paid by the week will receive a 10 per cent increase. Employees working by the hour who are not trainmen received an increase of 3 cents an hour and platform men's wages were raised 3 cents an hour for the first nine months, 8 cents an hour for the second nine months, and thereafter raised to 51 cents an hour.

The company estimates that the increase will add about $235,000 to the expenses for the year.

## Wages in Memphis Will Be Arbitrated

Unable to reach an agreement on the new wage scale for the employees of the Memphis Street Railway, Memphis, Tenn., for the year beginning April 1, representatives of the company and the union have announced their decision to leave the settlement to arbitration. This is in accord with the agreement made by both sides last year. On March 1, thirty days before the year's contract expired, the union advised the company of its demand for an increase. The company responded with the demand for a 4-cent cut, which was refused by the employees. Then representatives were appointed to confer in an effort to reach an agreement. The wage scale in effect for the last year is 42 cents an hour for first year men, 47 cents for second year men and 52 cents for men in the service longer than three years.

## Fare Readjustment Asked in Baltimore

The United Railways & Electric Company, Baltimore, has filed with the Maryland Public Service Commission a petition asking that rates and charges be fixed to yield the company an annual net income of $1,500,000. The request also is made that until this be done the present rates and charges be maintained. The present fare is 7 cents.

The petition is signed by C. D. Emmons, president, and William H. Maltbie and Joseph C. France, attorneys for the company. It is pointed out that $1,500,000 is the income which the commission itself had decided was reasonable, necessary and in the public interest. The minimum annual net income set by the commission was $1,000,000.

In its appeal to the commission the company says that the granting of the petition, which seeks to readjust fare zones, will reduce materially the gross income without decreasing the expense of operation. Although no request is made for a specific rate, the petition points out that the 7-cent fare is lower than that charged in many other cities.

In 1919, the petition states, the commission established rates and charges intended to yield a minimum surplus of $1,000,000 to the company and placed upon the latter the burden of increasing this amount to $1,500,000 through exercising economy and efficiency. Statements filed during the last four years show that from Jan. 1, 1920, to Dec. 31, 1923, the total net surplus is $3,454,365, or $2,545,635 less than the $6,000,000 which should have been collected at the rate of $1,500,000, the amount set forth by the commission as necessary in the interest of the public.

## Rerouting Proposals in Toledo Approved

The City Council at Toledo has approved eleven of the individual proposals in the rerouting plan submitted some weeks ago by Commissioner W. E. Cann for extensions and betterments to the service supplied by the Community Traction Company. One which has been delayed is the elimination of the Indiana line. The most important item in the new legislation was the final approval of the trackless trolley crosstown line by way of the Fearing Street subway. The new route for the Long Belt line, which will be out Contan Street and Cherry to Central Avenue and providing for elimination of tracks on Collingwood Avenue between Delaware and Central, is another important move. The north arm of the Short Belt will be connected up with the southern arm of the Bancroft Belt. The new extension of Summit Street will be double-tracked. Track will be laid in Jackson Street for a new short interurban loop downtown. Extensions will be made on the East Broadway line and the Erie Street bus feeder will be eliminated. The Collingwood bus line, Ottawa Park line, elimination of the Michigan line and change in route for the Erie Street line will come up later for action by Council. In voting upon the separate issues the Council also approved a general rerouting of the cars in the business section.

Commissioner Cann told the members of Council that he had figured the deficit down to $48,000 a year under the new system and believed that additional business would make that up and add to the stabilizing fund.

He said in a letter to Councilman Dowd that the adoption of the plan would not result in increased fares, but would produce material increases in the balance of the stabilizing fund. His original estimated deficit was $102,857. He believed the new power rate offered by the Toledo Edison Company would mean a saving of $100,000 a year.

The officers of the Community Traction Company will have to go over the projects and give their views on probable costs and revenues before the improvements can be made. Then there will come the necessity for financing.

## Bus Drivers Strike in Newburgh

Bus drivers employed by the Public Service Corporation of Newburgh, N. Y., went on strike March 18 and the city was without bus service until March 21. The strike was called in protest against the discharge of sixteen members of the bus drivers' union and the arrest of three others on complaint of the corporation on charges of larceny and alleged improper handling of collections.

When the members of the drivers' union became convinced that the company's action in discharging the sixteen employees was not an attack upon the union itself, the men returned to work. The sixteen discharged drivers were not reemployed, although charges against them are understood to have been dropped. Buses were installed to replace the local railway some time ago.

## Strike in Scranton

### Inability to Agree on Questions of Wages and Rush-Hour Tripper Service Results in Walk-Out

Railway service was abandoned in Scranton, Pa., on April 1, when 600 employees of the Scranton Railway walked out following the inability of the company and the men to come to an agreement on wages and rush-hour tripper service. The trainmen are demanding an increase of 17 cents an hour. The company is willing to submit both the wage question and the rush-hour tripper service to arbitration, but the men are demanding that only the wage be arbitrated and that the question of tripper service be dropped.

A conference between representatives of the company and the striking employees was held on April 3, the participators being Mayor John Durkan, Bishop J. J. Hoban, the publishers of both daily newspapers and representatives of the United States Department of Labor. Neither side would recede from the position taken and the conference adjourned without any progress having been made. In order to meet the emergency caused by the strike the Public Service Commission has granted authority to the city of Scranton to issue ten-day permits to jitney operators provided satisfactory guarantee as to personal and property liability is given.

The wage contract expired on April 1. Prior to that date Division 168 of the Amalgamated presented a contract asking for an increase for all employees, amounting to 17 cents an hour. Along with this demand double time was sought for Sundays for trackmen, carhouse men and shopmen. A meeting was held on March 25, at which the men presented their demand for increased wages. When the increase was refused the men inquired what counter proposition the company had to offer. The company then submitted the contract the men are now working under, with a proviso for "spread runs," i.e., runs twenty or less to take care of morning and afternoon rush. Under them the men would work approximately eight hours in a spread of thirteen, similar to men in other cities. Following that meeting the employees' committee called a midnight meeting, took a strike vote and notified the management that the men would not arbitrate the questions involved.

The wages paid to the Scranton Railway employees have been advanced 26 per cent since January, 1920. At that time the wage was 50 cents an hour. The present scale is 63 cents an hour. With the demand of the men satisfied the scale would amount to 80 cents an hour, totaling an increase to the company of $300,000 a year.

In a statement to the public J. J. Coleman, general manager, said the net profit last year, after deducting operating expenses, taxes, bond interest and other fixed charges, was only $94,000. The company's earnings for the year were $85,000 short of what the State Public Service Commission fixed as the amount the company was entitled to earn. Of last year's net profit of $94,000, $80,000 was earned during the first three months. Wages were raised to their present level on April 1, and from that date to the close of the year, a period of nine months, only $14,000 was earned.

## Weekly Pass in Victoria—Free Movie Admittance

Weekly passes were put in effect on the Saanich line of the British Columbia Electric Railway, Victoria, B. C., on March 29. This is an interurban line, 24 miles in length, traversing a rural district adjacent to Victoria. The basis will be less than the price of six round-trip tickets between two points. The purpose is to improve traffic, which has been cut down by motor and bus competition. The Saanich line has been operated with one-man cars for more than a year. Under the pass system, a passenger when boarding a car will show his pass and receive a "hat check," which he will deposit with the operator on leaving the car. In order to popularize the new passes the company has arranged to have passholders admitted to one of the moving picture theaters free on every Thursday in April. A supply of passes for four weeks may be bought at once.

# Foreign News

## Tramway and Bus Strike in London

A great strike of tramway and bus employees in London began on March 22, causing enormous inconvenience and loss of time to the public. All the tramway undertakings of the metropolis and the London General Omnibus Company were involved, but a comparatively small number of buses belonging to minor companies continued to run. These, however, were but a drop in the bucket. People had to use the steam and electric main lines, where these were available, or to walk, except in the case of those wealthy enough and fortunate enough to be able to use cabs. Both tramway men and busmen are now combined in one trade union called the Transport and General Workers Union. It was primarily a tramway men's strike, their demand being for an increase of wages of 8s. per week. The bus men had no particular grievance, but they came out "in sympathy" with the tramway men.

The wages ruling in the London district for tramway drivers and conductors at the time of the strike were 58s. per week, rising to 67s. after two years' service. The bus drivers began at 80s. 6d., rising to 86s. 6d., while the conductors got 73s. 6d., rising to 79s. 6d. It had always been contended that bus drivers' work requires more skill than tramcar drivers' work, and that this is the reason for the difference of pay.

It was computed that about 25,000 bus employees and 17,000 tramway employees were affected by the strike. The tramway undertakings involved were those of the London County Council and a number of smaller ones, some belonging to local authorities and some to companies in the outskirts of London.

The strike was preceded by negotiations between representatives of the parties, but these proved futile, and the government thereafter set up a court of inquiry to ascertain the facts.

For the last few years tramway men's wages in England generally have been regulated by a national agreement under which wages rise or fall 1s. per week for every five points rise or fall in the official index figure of the cost of living. By their demand and by their strike action the London men broke away from the agreement, and did so without giving the stipulated three months' notice. They averred that their wages were 5s. a week lower than in September, 1922, when the cost of living figure was the same as now. That did not appear to accord with the sliding scale agreement.

Before the negotiations collapsed, the tramway authorities, while declaring that the financial condition of their undertakings was such that they were unable to pay any higher wages, in some cases made compromise offers. The London County Council, West Ham, and Walthamston offered an increase of 5s. per week, while others offered 2s. and some offered nothing. An alternative proposal by the employers was that the whole dispute should be submitted to arbitration.

The main reason given by the employers for the bad financial position of the tramways was unrestricted bus competition. The trade union representatives rejected all the offers made by the employers.

It was when the National Council for the tramway industry found that it could not solve the difficulty that the individual offers were made by the employers. The London County Council issued a statement to the effect that its offer of 5s. a week would mean an increased expenditure of at least £100,000 a year, while the receipts for the present financial year now closing showed a decline of nearly £400,000 compared with the previous year.

The position of the tramway companies affected which are included in the underground railways "combine" was set out in a statement signed by Lord Ashfield, chairman of the group. In this it was stated that for the year 1923 the return on capital of the Metropolitan Electric Tramways, the London United Tramways Company and the South Metropolitan Electric Tramways, after providing a totally insufficient sum for renewals, was less than two-thirds of 1 per cent. In the first two months of this year the three companies were in a worse position and actually failed to meet their fixed charges by £6,393, and had no funds for renewals. The earnings lost to the tramways were not gained by the underground railways or the buses.

# Financial and Corporate

## Birmingham Properties Sold

### Local Railway and Light Units Pass at Foreclosure to National Power & Light Company

The properties of the Birmingham Railway, Light & Power Company were sold for $18,500,000 to the National Power & Light Company, New York, at noon March 31 in front of the courthouse door by J. S. Pevear, special master. The properties were bought in the name of the Birmingham Electric Company, organized a few days ago to purchase and operate the properties. Bidding was spirited. Starting at $13,000,000, the price gradually rose to $18,500,000.

Other companies which bid for the properties were the United Gas & Electric Engineering Company, New York, and the L. H. McHenry Company, Louisville, Ky. L. B. Hatch represented the purchasing company at the sale.

Sale of the property was made subject to outstanding debts and it is understood that the bid accepted will make the price of the properties approximately $30,000,000. There are outstanding about $9,500,000 of bonds, which it is stated are to be assumed, and about $2,000,000 receiver's obligations, which must be met.

#### TIDEWATER SALE POSTPONED

Sale of the so-called Tidewater line was called for 12:30 o'clock, but no bidders appeared. Mr. Pevear announced that the sale would be postponed until April 14, at noon, when this line will again be offered for sale. Should there be no bidders at that time, Mr. Pevear announced that the line will continue to operate in the hands of the receivers and efforts will be made to give as good service as its receipts will permit.

Confirmation of the sale of the Birmingham Railway, Light & Power Company property is expected following the return of Judge William I. Grubb of the United States District Court from New Orleans. Pending the confirmation of the sale and the formal transfer of the properties to the Birmingham Electric Company, the operation will continue under the direction of Lee C. Bradley and J. S. Pevear, co-receivers.

H. C. Abell, president of the National Power & Light Company, stated following the sale that his company, some two or more years ago, acquired the capital stock and some of the debt of Birmingham Railway, Light & Power Company, formerly owned by American Cities Company. He said that more than $10,000,000 of debts of the old company will be paid off in full, thus laying the basis for a sound program for future financing. Among the debts so to be paid will be the $781,000 of first mortgage 5 per cent bonds of Birmingham Railway & Electric Company which fall due on July 1, of this year. It is expected that arrangements will be made so that the holders of these bonds can get principal and accrued interest at any time on surrender.

In line with modern practice the Birmingham Electric Company will have non-par value stock, both preferred and common. No change is contemplated in the present executive management. The temporary board of directors of Birmingham Electric Company will continue to function for the time being, but it is expected that the permanent board of directors will be composed, for the most part, of residents of Birmingham.

A new modern serial mortgage will be created and bonds will be issued to pay a part of the debts of the old company. Between $4,000,000 and $5,000,000 of the present company's so-called senior securities will be shifted into common stock as a result of the reorganization.

## Conference on St. Louis Reorganization Held in New York

F. O. Watts, president of the First National Bank, St. Louis, and one of the financial group most active in the reorganization plans for the United Railways, St. Louis, acted as chairman of the conference held in New York on April 2 to consider the affairs of the company. He is expected to be in St. Louis on April 7 and at that time will issue a statement. The meetings in New York have been under the auspices of the St. Louis Transit Company 5 per cent bondholders combined committee. Edwin M. Bulkely of Spencer, Trask & Company is chairman of this committee and William P. Gest of the Fidelity Trust Company, Philadelphia, vice-chairman. It is believed that this committee, working with the executive committee, will formulate the policies which will lift the receivership. Newman, Saunders & Company, New York, are mentioned as bankers for the reorganization committee.

## New York State Railways Buys Bus Company

The New York State Railways has purchased a majority interest in the East Avenue Bus Company, Inc., operators of a 10-mile route from the heart of Rochester to Pittsford, according to J. J. Basrow, president of the bus company. Plans are under way for an extension and improvement of service. The East Avenue line will retain its separate identity. The bus line operates over East Avenue, Rochester's finest shopping and residential street, connecting the business and exclusive suburban districts. The railway operates trolley service between Rochester and Pittsford over a different route. No immediate change in either route is anticipated.

## Investment Opportunities in Tractions Overlooked

There are neglected opportunities in the public utility field similar to those investment bargains which prevailed in railroad securities four years ago. This is the conclusion of H. M. Jacoby of the banking firm of H. M. Jacoby & Company, New York. He says that investors four years ago needed courage to buy railroad issues; to-day they need courage for investment in many utilities, notably tractions. Mr. Jacoby says the time of acquisition should be at the turning point and not after everything becomes bright and rosy again.

Remarking that his firm was not obligated to hold any briefs for electric railways, Mr. Jacoby pointed out that there were many bonds of such companies selling to yield 8 to 10 per cent, a condition due to the fact that the average investor had not noticed the changing position of the traction business. In a statement made to the ELECTRIC RAILWAY JOURNAL he continued:

> It so happens that in the nature of the case there will always be certain groups of securities which are at times unpopular with investors. This has, for instance, been the case with traction securities. This lack of popularity was certainly well deserved, considering that during the period of ultra-inflated operating costs—1919—receiverships of electric railways amounted to $634,174,000 par value of securities.
>
> However, is it not interesting to note that this figure of over half a billion was reduced to only $23,039,000 in 1923 and that this figure is the lowest and most favorable one in fifteen years?
>
> We have heard a good deal about bus and automobile competition. Yet car rides per capita have increased from 100 in 1912 to 109 in 1917 and to 117 in 1922. In other words, the growth of traffic has been just about as rapid during the past five years as it has been during the five preceding years. The truth of the matter is that notably in the larger cities the automobile reaches the saturation point at a given angle while bus competition can only be of a supplemental character.
>
> To cite two recent cases: When the street car franchise in Akron expired, on Feb. 1 of this year, the trolleys were ruled off the streets and a bus service was started. Only a few weeks later, a petition signed by 33,000 citizens forced the Mayor to reinstate the trolleys on an equitable fare basis, while the jitney competition was eliminated. In New Jersey, where the jitney competition is probably more keen than in any other part of the United States, 8,000,000 more passengers were riding on the lines of the Public Service Railway in December, 1923, than in December, 1922. Here are facts with no opinion involved.

Mr. Jacoby also referred to the recent decrease in cost of certain basic commodities used by the electric railways as factors making for lowered operating costs.

## $1,027,238 Deficit in Buffalo

There was a deficit last year of $1,027,238 in the operation of the International Railway, Buffalo, N. Y. The passenger revenue during 1923 was $9,468,124 and revenue from other sources $327,061. The report states that the operating revenue was $926,093 less in 1923 than in 1921, the year before the last strike. The difference in the revenue is explained by the operation of jitneys and the practice of motor car owners in giving a lift to persons who would otherwise use the street cars.

President Tulley told the stockholders that the Bailey Avenue bus line is being operated at a loss of $2,000 a month.

The International now awaits only the determination of its property value and the sanction of a higher fare, says the report, to complete the following program:

> To render adequate service to the public; to promote among the employees efficiency and co-operation and a betterment of their conditions; to protect the owners' investment in the property and to assure the earning and payment of a reasonable return.

Mr. Tulley states that 99 per cent of the eligible employees of the I.R.C. are stockholders of the company. The wages of I.R.C. employees were raised 2½ cents an hour for 1924. They signed over the money, amounting to about $200,000, to the trustees of their association, who bought for them $1,000,000 par value I.R.C. stock for $100,000 and $200,000 par value I.R.C. bonds at 50 cents on the dollar. This investment will pay them 5 per cent.

A separate individual savings fund has also been started for the men.

# New Jersey Company Making Progress

## President McCarter Looks Hopefully Toward the Future—Reviews the Past Year's Work—Riding Is on Increase and Revenues Are Better

THE Public Service Corporation of New Jersey reports for the year ended Dec. 31, 1923, a net increase in surplus before the payment of common stock dividends of $3,737,179. The Public Service Railway, operating 893 miles of track and 2,420 cars, and its affiliated companies report deficit of $1,675,534 for the year.

In reviewing the affairs of the company, President T. N. McCarter, in speaking of the railway, says that the company has made considerable progress in perfecting its plan for co-ordinating street car and bus service and has been able to put into effect some important economies in operation, which permit the hope that, with public co-operation in the carrying out of the company's co-ordination scheme, the railway will, within a reasonable time, be operating on a satisfactory and stable basis. Mr. McCarter says that the new rates have not so far produced adequate revenue for the operation of the system, but that they have quite largely increased riding and that revenue is much more satisfactory than at first.

Operation of the railway for the first six months of 1923 showed a margin of some $202,000 after payment of operating expenses and fixed charges, but this amount and more was needed to meet the deficit accumulated since 1917. Trouble for the company was precipitated with the expiration on Aug. 1 of the wage agreement with the railway employees and their demand for an increase in pay amounting to 30 per cent.

The financial condition of the company was such that it was impossible to grant the men's demand. Every endeavor was made by the company to secure a renewal of the agreement with the men at the old pay and as a compromise the company offered to apply to wage increases the estimated suplus for the year, but without success. On Aug. 1 the trainmen quit work and for a period of fifty-one days no cars were operated. The decision of the company not to attempt operation with new employees was based on the impossibility of securing a sufficient number of competent men and upon its belief that any attempt to run cars would lead to disorder and the destruction of property.

After careful consideration, there was presented to the state and municipal authorities and to the public generally a "plan of settlement," providing for the co-ordination of both trolley and bus operation under the company's management. It was stipulated that the company would purchase competing buses, give employment to competent bus operators, grant a 20 per cent increase in wages to employees and put into effect a universal fare of 7 cents with transfers between trolleys and buses. The municipal and state authorities were asked to co-operate.

This plan indorsed by commercial organizations all over the state, was accepted by a number of municipalities and petitions favoring its acceptance were signed by nearly 400,000 citizens. Owing to the mixed jurisdiction of the state and the municipalities, however, the plan was not accepted. The stoppage of street car service and the inability of the buses adequately to supply the demand for transportation was in the meantime causing such loss and inconvenience to the public, and especially to business men, their employees and patrons, that the Governor of the state, acting through the Attorney-General, and on the plea that public interest required the immediate resumption of street car service, brought an action in equity before the Chancellor for an injunction to compel the company to resume service.

In granting the injunction, the Chancellor pointed out that the way was open for a just settlement of the transportation difficulty, saying as to the effect of the court's action: "I think . . . that the effect will be to stimulate negotiations to settle the many difficulties with which the company is confronted."

The injunction was accepted without appeal by the company, which granted a 20 per cent increase in wages and resumed operation on Sept. 21.

Mr. McCarter explains that shortly afterward the company adopted, at the suggestion of the Board of Public Utility Commissioners, for a trial period of four months beginning Oct. 1, a rate schedule which provided within the limits of the larger cities served a 5-cent fare with an additional 5-cent charge in the suburbs, no transfers. The rate of 8 cents, four tokens for 30 cents, 1 cent transfer, in effect before the strike, was continued in all other parts of the territory. This schedule as applied to the traffic of the railway is substantially equivalent to the fare in effect before the cessation of service.

With respect to the railway's rate case Mr. McCarter says that on June 9, 1923, former Judge Thomas G. Haight, the special master appointed by the United States District Court to take evidence in the proceedings instituted by the Public Service Railway in 1921, handed down a report fixing the value of the company's property used and useful in the operation of the company at $110,000,000 and continuing the rate of 8 cents, four tokens for 30 cents, 1 cent transfer.

To this report the company filed exceptions on the ground that several items had been improperly omitted which if included would have given the property an increased value, while the defendants excepted on the grounds that the value was too high. The exceptions have been argued before the District Court, which reserved decision. On Oct. 1 the fare schedule now in effect was applied for at the suggestion of the Board of Public Utilities Commissioners and was accepted by the United States District Court, without prejudice to the proceedings before that court.

During the year the railway charged to fixed capital installed during the year $2,651,089, less $603,359 of property written off, leaving the net in-

INCOME ACCOUNT OF PUBLIC SERVICE RAILWAY AND AFFILIATED COMPANIES FOR THE TWELVE MONTHS ENDED DEC. 31, 1923

| | Public Service Railway | Public Service Railroad | Affiliated Companies | Total |
|---|---|---|---|---|
| Operating revenues | $21,524,601 | $265,533 | $1,314,868 | $23,105,003 |
| Operating expenses and taxes | 17,407,259 | 212,534 | 977,829 | 18,597,623 |
| Amortization charges | 945,553 | ........ | 137,200 | 1,082,753 |
| Operating revenue deductions | 18,352,812 | 212,534 | 1,115,029 | 19,680,376 |
| Operating income | 3,171,788 | 52,999 | 199,839 | 3,424,627 |
| Non-operating income (exclusive of dividends of affiliated companies) | 93,375 | 808 | 26,126 | 120,308 |
| Gross income | 3,265,163 | 53,807 | 225,965 | 3,544,936 |
| Income deductions (bond interest, rentals and miscellaneous interest charges) | 5,244,217 | 114,576 | 52,715 | 5,411,510 |
| Net income or loss | *1,979,054 | *60,769 | 173,249 | *1,866,574 |
| Profit and loss accounts (excluding dividends) | †176,697 | †3,688 | †10,829 | †191,215 |
| Surplus—(before dividends) | *1,802,357 | *57,080 | 184,079 | *1,675,358 |
| Intercompany dividends | †284,624 | ........ | 284,624 | .......... |
| | *1,517,733 | *57,080 | *100,544 | *1,675,358 |
| Dividends paid unaffiliated interests (directors) | .......... | ........ | 176 | 176 |
| Net increase or decrease in surplus | *$1,517,733 | *$57,080 | *$100,720 | *$1,675,534 |

* Deficit. † Credit.

TRAFFIC STATISTICS OF THE PUBLIC SERVICE RAILWAY FOR LAST TEN YEARS

| Year | Revenue Passengers | Transfers and Passes | Total Passengers | Percentage of Passengers Using Transfers | Average Fare per Passenger, Cents | Car-Mileage | Car-Hours | Passengers per Day | Passenger Receipts per Car-Mile, Cents | Passenger Receipts per Car-Hour |
|---|---|---|---|---|---|---|---|---|---|---|
| 1914 | 310,308,660 | 96,969,254 | 407,277,914 | 21.2 | 3.83 | 50,792,889 | 5,665,119 | 1,115,830 | 30.72 | 2.75 |
| 1915 | 313,923,363 | 100,498,677 | 414,422,040 | 21.5 | 3.82 | 51,873,660 | 5,573,670 | 1,135,403 | 30.49 | 2.84 |
| 1916 | 342,205,993 | 109,492,019 | 451,698,012 | 21.8 | 3.82 | 54,964,708 | 5,911,131 | 1,234,147 | 31.37 | 2.92 |
| 1917 | 361,187,782 | 115,787,201 | 476,974,983 | 21.9 | 3.82 | 56,087,403 | 6,021,225 | 1,306,781 | 32.44 | 3.02 |
| 1918 | 352,190,897* | 98,029,909 | 451,220,806 | 20.0 | 4.31 | 54,039,150 | 5,698,089 | 1,236,221 | 36.00 | 3.41 |
| 1919† | 327,619,606* | 69,069,628 | 396,689,234 | 15.4 | 5.71 | 57,644,927 | 6,039,453 | 1,086,820 | 39.29 | 3.75 |
| 1920 | 363,757,587* | 89,777,107 | 453,534,694 | 17.7 | 5.79 | 60,798,743 | 6,539,207 | 1,239,166 | 43.21 | 4.02 |
| 1921 | 348,284,212* | 87,395,589 | 435,679,801 | 17.3 | 5.90 | 58,309,883 | 6,212,276 | 1,193,643 | 44.11 | 4.14 |
| 1922 | 325,265,180* | 84,947,634 | 410,212,814 | 17.6 | 6.27 | 56,419,982 | 5,983,122 | 1,123,871 | 45.59 | 4.30 |
| 1923 | 300,319,928* | 53,875,005 | 354,194,933 | 12.4 | 5.95 | 49,272,078 | 5,206,092 | 970,397 | 42.75 | 4.05 |

* Excluding revenue transfer passengers. † Mile zone system in effect from Sept. 14 to Dec. 7.

crease in the fixed capital $2,047,729. The railway also retired $388,000 of equipment trust certificate of series "D," "E" and "F" in accordance with the equipment trust agreements.

The report contains as a frontispiece a reproduction of a half-tone showing types of cars, buses and operators for use in co-ordinated service.

## Issue of Stock for Acquisition Purposes Completed

The Charleston Interurban Railroad, Charleston, W. Va., has completed plans to issue $500,000 of cumulative participating preferred stock of the par value of $100. The company proposes to use the proceeds from the sale of 4,250 shares of the preferred stock to acquire all the capital stock of the Kanawha Valley Traction Company and the Charleston-Dunbar Traction Company and to use the proceeds from the sale of 750 shares of the preferred stock to defray the cost of certain improvements. The rest of the money from the sale of stock is to be used for other corporate purposes.

## Fare Advance in Cincinnati Explained

Exact figures on the operation of the Cincinnati Traction Company, Cincinnati, Ohio, for February and on which the fare advanced on April 1 from 8½ to 9 cents have been announced by W. J. Kuertz, Director of Street Railroads. The deficiency for February was $24,826, and the total loss for two years—1922 and 1923—is $574,786. This includes deficiency for city tax since Oct. 1, 1923. For three months in 1923, October, November and December, the city tax amounted to $89,000. For the two months in 1924, January and February, it amounted to $57,677. The deficiency for return on capital in 1922 amounted to $163,278 and in 1923 to $264,830.

There was a daily decline in the number of revenue passengers for February, 1924, as compared with 1923, although the aggregate for February this year is greater, due to having twenty-nine days. The revenue passengers in February, 1924, brought $8,549,249 and in February, 1923, the revenue was $8,343,104.

Although detailed figures are unavailable the number of daily passengers during March is 10,000 below that of March a year ago. Unemployment, the use of the radio in the homes and bad weather are some of the explanations offered, as well as the increase in fare, it being 1 cent more this year.

## Purchase of Boston "L" by State Urged

An order has been filed in the Massachusetts Legislature calling for the appointment of a special commission to consider the advisability of the state acquiring the property of the Boston Elevated Railway. Representative Coyne contends that under the present law the State has the right to purchase the properties by paying the amount of the outstanding stock, approximately $52,000,000. He said purchase by the state would save $4,000,000 in dividends annually and that it would eventually result in a reduction of fare.

## Indiana Road Purchased from Bondholders

Purchase of practically all bonds of the Goshen and Peru divisions of the Winona Interurban Railway, Warsaw, Ind., by Harry Reid and James P. Goodrich, Indianapolis, and Theodore Frazer, Warsaw, has been announced.

The plan of the new holders of the bonds, according to Pierre Goodrich of Mote & Goodrich, is to foreclose the mortgages on the property, sell the railway and terminate the receivership.

More than $2,000,000 in bonds are outstanding, $1,593,700 on the Peru division and $750,000 on the Goshen division.

Plans of the new owners include through traction service from Indianapolis to South Bend, both for passenger and freight service.

Mr. Reid, one of the purchasers, is president of the Interstate Public Service Company, but it is said that that company is not interested in the purchase as a company although the lines bought will be tied in with those of that property for through operating purposes. In fact, the Winona property, extending from Peru to Goshen through Warsaw and Winona Lake, is the connecting link in a through interurban route from Louisville through Indianapolis to South Bend and Chicago.

The likelihood of this purchase being made was referred to in the ELECTRIC RAILWAY JOURNAL for Feb. 2, page 195.

## Arrears in Dividends Being Paid in Worcester

The directors of the Worcester Consolidated Street Railway, Worcester, Mass., have declared an extra dividend of $2.50 a share to apply on dividends in arrears on the 5 per cent cumulative preferred stock. The dividend was paid by the company on April 1 to stock of record March 20.

On April 1, 1922, the accumulated and unpaid dividends amounted to $20. At that time a $2.50 extra was paid and this has continued semi-annually. The dividend paid on April 1 this year makes the fifth extra and cuts the amount in arrears from $20 to $7.50.

## Operation Abandoned Between Greenfield and Northampton

The towns on the 20-mile stretch between Greenfield and Northampton, Mass., which for twenty years have been served by the Connecticut Valley Street Railway, are without service. The operation of the line ceased March 31 at midnight. The receiver will delay application to the courts to dismantle the road pending possible purchase of it by the towns themselves for municipal operation. Nine miles of the Greenfield to Northampton division have already been thus purchased with the intention of reopening the road. The portion sold runs from Greenfield through Deerfield and South Deerfield. Traffic between Greenfield and South Deerfield is now being handled by a bus service.

## Rochester Valuation May Be Reduced

Unofficial reports say that a settlement of the litigation instituted by the city of Rochester to reappraise the Rochester lines of the New York State Railways under the service-at-cost contract is in prospect. Conferences looking toward a settlement have been held and it is said to be not unlikely that an amicable adjustment of the entire matter will be had to the best interests of the company and also to the public.

The plan for settlement is said to comprehend a reduction in the valuation, principally by the elimination of certain items in the appraisal, which the company will consent to as a matter of compromise. Such a readjustment, possibly by the elimination of certain real estate, will bring a reduction in the valuation and with it will go the possibility of the public of the city of Rochester obtaining a lower fare.

James F. Hamilton, president of the New York State Railways, is confident that the present appraisal is justified by any method of appraising that may be used, and maintains the actual book value of the property used and useful, under methods of appraisal approved by the United States Supreme Court, can result only in a higher valuation than that now existing.

In commenting on the matter one of the Rochester papers says:

> The attitude of the company has been to welcome the trial of the litigation so as to settle once and for all the valuation matter, but Mr. Hamilton has expressed a willingness to compromise the proposition by eliminating certain factors, so that the earnings of the company, under the contract, will be based largely on the property actually in use in the conveyance of passengers. This is looked upon by the city officials as a broad concession and one that will reflect to the benefit of the public.

## Capital Structure to Be Rearranged at Portland

Stockholders of the Portland Railway, Light & Power Company, Portland, Ore., have been requested to meet and approve plans for the issue of $7,500,000 of 6 per cent first preferred stock. The company plans to rearrange its capital structure and to change the name to Portland Electric Power Company.

**Auction Sales in New York.**—At the public auction rooms of A. H. Muller & Sons there were no sales of electric railway securities this week.

**Seeks to Abandon Service.** — The Pacific Electric Railway, Los Angeles, Cal., has applied to the Railroad Commission for permission to abandon passenger service on the Santa Monica air line from Colorado Street, Santa Monica, to the end of the line.

**Discontinuance of New Jersey Line Approved.**—The Board of Public Utility Commissioners of New Jersey on April 1 approved the application of the Public Service Railway to abandon service on the Fairview extension located between Broadway and Warren Streets, Gloucester, and Collings and Mount Ephriam Avenue, Camden. No opposition was offered by local authorities. The company is required to remove appurtenances. The road yielded $4,000 a year and operation costs totaled $20,950. It is said that the company is prepared to increase the present bus service over the route.

**Thrift Being Encouraged at Buffalo.**—In co-operation with the Bank of Buffalo branch of the Marine Trust Company, Buffalo, the International Railway Co-operative Association has started a savings plan in addition to the co-operative wage fund for the benefit of employees of the company. The co-operative wage fund provides for impounding the wage increase granted on Jan. 1, and diverting the fund thus accumulated to purchase bonds and stock of the railway. The thrift and savings plan is a separate and distinct movement fostered to encourage regular weekly savings by employees.

**Mortgage Gold Bonds Offered.** — A syndicate including E. H. Rollins & Sons, New York, is offering at 98½ and accrued interest to yield about 6.10 per cent $5,000,000 of the Illinois Power & Light Corporation first and refunding mortgage gold bonds known as Series "A," 6 per cent, thirty years. The bonds are dated April 2, 1923, and are due April 1, 1953. They are secured by direct mortgage or collateral lien on properties appraised at a value very substantially in excess of the total debt and are a direct first mortgage on some of the most important power and light properties of the system.

**Want to Abandon Passenger Service.**—The Pacific Electric Railway, Los Angeles, Cal., has applied to the commission for authority to abandon passenger service on its line between Fifth Street (San Pedro district) and the Outer Harbor.

**Revaluation of Kansas City Properties Asked.**—The reorganization committee of the Kansas City Railways on March 31 at Jefferson City, Mo., filed with the Missouri Public Service Commission an application for a revaluation of the railway. The application was made with the consent and approval of Judge Kimbrough Stone, and of the receivers for the company.

**Net Income Shows Increase.**—The Department of Street Railways, City of Detroit, Mich., reported a revenue from transportation of $1,906,121 during February, 1924. In February, 1923, this item was $1,528,539. The total operating revenue for February, 1924, was $1,946,727, against $1,619,266 for February a year ago. Total operating expenses increased from $1,185,779 in February, 1923, to $1,418,595 in February of the present year. The net income showed an increase, being $40,834 in February, 1923, and $99,258 in February of the present year. There was an increase in total passengers carried. The number in February, 1923, was 37,707,665 and in February, 1924, 40,970,792.

**Private Sale of Property.** — The Greenfield & Turners Falls, division of the Connecticut Valley Street Railway is to be offered at a private sale by receiver D. P. Abercrombie of Greenfield, Mass. People of Turners Falls and Greenfield are united in their desire to maintain trolley service between the two towns, and arrangements with this point in view are being made.

**Bus Line to Be Sold to Pacific Electric.**—The Compton Transportation Company has been authorized by the Railroad Commission to sell to the Pacific Electric Railway, Los Angeles, Cal., its auto stage rights and property for a line operated between Long Beach, Huntington Park and intermediate points.

**Accumulated Surplus $1,000,000.**—The Los Angeles Railway Corporation, Los Angeles, Cal., reports to the Railroad Commission for the year 1923 that its operating revenue was $12,645,436 and operating expenses $8,915,490, giving a net operating revenue of $3,729,946. Miscellaneous non-operating revenue amounted to $113,820. Interest, rent, taxes and other deductions totaled $2,306,095. The net corporate income for the year was $1,537,670. The deficit at the beginning of the year amounted to $13,017. Miscellaneous additions to surplus for 1923 amounted to $7,497 and miscellaneous deductions were $251,874, leaving an accumulated surplus at the end of the year of $1,280,276.

**Another Preferred Dividend at Louisville.**—There is a strong probability that the back dividends of the Louisville Railway on its preferred stock will be cleaned up by Jan. 1, 1925, or not later than April 1, if business continues active. Directors at a meeting on March 20 declared a 2½ per cent dividend on the preferred stock, payable on April 4. This left 2½ per cent due from 1922, 5 per cent from 1923 and 1¼ per cent for the first quarter of 1924.

**Market Street Ready to Redeem Bonds.**—Notice has gone out to holders of the first consolidated mortgage gold bonds of the Market Street Railway, San Francisco, maturing on Sept. 1, that there has been deposited money sufficient to pay these bonds at par and accrued interest. Holders are accordingly advised to present their bonds for payment at any time prior to Sept. 1 at the office of the trustee at San Francisco or at the office of Ladenburg, Thalman & Company, New York. The bonds maturing on Sept. 1 were authorized in the amount of $17,500,000 on Sept. 1, 1894. The amount outstanding on Jan. 31, 1923, was $9,527,000.

**$400,000 Issue Quickly Oversold Locally.**—The Houston Electric Company has, in five and one-half selling days, just oversold an issue of $400,000 of the Galveston-Houston Electric Company 7 per cent bond-secured gold coupon notes. This money will be used to make part of the improvements to the Houston Electric Company's system under the agreement recently entered into between the company and the city provided jitneys are abolished in accordance with the ordinance voted upon Jan. 19.

**$1,000,000 of Stock Offered.**—Tucker, Anthony & Company, New York, head a syndicate which is offering for subscription at 93½ and accrued dividend, to yield about 7.50 per cent $1,000,000 of 7 per cent cumulative preferred stock of the Consolidated Power & Light Company. The company, directly or through subsidiaries, owns and operates the electric power and light and electric railway business in Huntington, W. Va.; Roanoke and Lynchburg, Va., and in Ironton, Ohio, Ashland and Catlettsburg, Ky., and the surrounding communities, as well as the gas business in Lynchburg. The proceeds of the issue are to be used for additions and improvements which will further expand the revenue producing facilities of the system.

**Increase in Net Income.**—The net income of the East Penn Electric Company and its predecessors for the year ended Dec. 31, 1923, was $603,482, against $399,991 for the same period ended Dec. 31, 1922. This fact was disclosed in the first annual report of the company, which was incorporated in July, 1922, under the laws of Pennsylvania to acquire control of the Eastern Pennsylvania Railways and to provide increased power generating facilities for the territories served by that company. During the year 1923 the consolidations were completed. The East Penn Electric Company is under the management of the J. G. White Management Corporation, New York.

# Personal Items

## Pittsburgh Personnel Changes

### Young Men, All Especially Resourceful, Appointed to New Posts with Pittsburgh Railways

F. W. Cogswell, J. B. Donley, C. C. Gillette and J. E. Davis, all recently appointed to new offices with the Pittsburgh Railways, are especially qualified by technical training and by temperament for the positions to which they have been assigned. As noted previously in the ELECTRIC RAILWAY JOURNAL Mr. Cogswell has been made director of traffic promotion, Mr. Donley director of public relations, Mr. Gillette traffic agent and Mr. Davis special investigator.

Few men have a more detailed knowledge of the traffic habits of Greater Pittsburgh than has Mr. Cogswell. Mention any spot in the iron, steel or smoky city (it goes by all these names) and Fred Cogswell will rattle off the routes that pass by in the day and the night like the well-known hail from a machine gun. Before his appointment to the position of director of traffic promotion, Mr. Cogswell was traffic agent for the receivers of the Pittsburgh Railways, from August, 1917, to May, 1919. He served during the war as first lieutenant and later as captain and adjutant of the 53d U. S. Infantry. Before that he was assistant to the electrical engineer and traffic agent of the Pittsburgh Railways. He entered the service of the Pittsburgh Railways as load dispatcher in December, 1910. He was graduated at Carnegie Institute of Technology in electrical engineering in June, 1912. Mr. Cogswell was born in 1881.

In his new post with the company Mr. Donley looks after the newspapers, public neighborhood meetings held for the discussion of local service problems and explains matters to visiting complainants. It is no reflection on the Pittsburgh Railways to say that this is a difficult job to handle, for no matter how hard a company strives to be 100 per cent perfect different people have different ideas of perfection, so that the need exists for a peculiar combination of talent in the man assigned to handle the duties of an office of this kind. These Mr. Donley has. His resourcefulness has never failed him. He handles all the matters of a controversial nature that come before him with all the Celtic charm of a born diplomat. Mr. Donley was formerly employment agent and statistician for the mechanical department of the Pittsburgh Railways. He entered the service of the company as a shop clerk in 1902. In 1904 he was appointed chief clerk of the mechanical department, and in September, 1913, was appointed publicity agent in charge of exhibits. In June, 1915, he was appointed special investigator of the traffic department. Mr. Donley was graduated from high school and took a special course in economics at Duquesne University and a business course in the Iron City College. He was born Jan. 8, 1883.

Mr. Gillette will now apply his intimate knowledge of schedule construction to the commercial side of more miles for more revenue rather than the older purely operating viewpoint of fewer miles for less expense. Mr. Gillette was acting traffic agent of the company from May 1, 1923, to March 1, 1924. He entered the employ of the Pittsburgh Railways on Sept. 1, 1921, as a special investigator. Before that he was with the Westinghouse Electric & Mfg. Company. With that company he took the graduate students' apprentice course and special engineering course under B. G. Lamme. He also worked one year in the railway project section of the general engineering department. He entered the military service in May, 1917, and served with the Fourth Infantry, Third Division as a first lieutenant and captain from September, 1917, to December, 1919. He entered Bucknell University in 1913 and was graduated in electrical engineering in June, 1917. He was born on Sept. 1, 1895.

Mr. Davis was formerly chief clerk in the traffic department of the Pittsburgh Railways. He served in this capacity from April, 1921, to Feb. 20, 1923. He entered the service of the company in November, 1920, as a traffic observer. Before that for two years he had been timekeeper and paymaster for a mining company. He was graduated from high school in 1914 and from Geneva College in 1918, receiving the A.B. degree. In 1918 and 1919 he was principal of a high school. He was born on March 9, 1898, at Darlington, Pa.

F. W. Cogswell

J. B. Donley

C. C. Gillette

J. E. Davis

## Key Route Changes Made

### Announcement Affects Messrs. Drum, Harris and Allen—Mr. Harris Becomes Chief Engineer

New duties have been assumed by present officials of the Key System Transit in Oakland, Cal., and one new appointment has been made.

John S. Drum has been made chairman of the reorganized executive committee; George H. Harris, formerly assistant to Vice-President and General Manager W. R. Alberger, has been appointed chief engineer of the entire system, and Ben Allen, to whom reference has been made previously in the ELECTRIC RAILWAY JOURNAL, has been named as the head of the new public relations department.

In the promotion of Mr. Harris, Mr. Alberger, for the time being at least, is left without an assistant. Hereafter Mr. Harris will devote his entire time to engineering matters, including supervision of all the physical properties of the company. He has been in the business for thirty years. Mr. Harris has been with the Key System since 1914, being originally general superintendent. Before that he was connected with electric railways in Georgia and Alabama. Two years ago he was made assistant to the general manager of the San Francisco-Oakland Terminal Railways, a position from which he has just been promoted.

Mr. Drum was chairman of the executive committee of the former San Francisco-Oakland Terminal Railways and has been re-elected in the process of reorganization. He is well known in Pacific Coast banking circles. Mr. Drum was born in Oakland and was graduated in 1894 from Hastings Law College attached to the University of California. He practiced law until 1903 and then went into banking, becoming president of the Savings Union Bank & Trust Company in 1910. He is a director of the Pacific Gas & Electric Company, the East Bay Water Company and the Yosemite Valley Railroad.

Mr. Allen gained fame in the late war by acting as publicity director for Herbert Hoover in his food saving campaigns. He succeeds R. H. Brockhagen, press agent.

Now that a survey of Oakland's traffic needs is under way many suggestions are already beginning to pour in. Previously there was no department to handle this mass of detail. Most of it went to Mr. Alberger and his assistant. The bureau of public relations will fill this gap.

## Thomas J. Lynch Will Resign

Thomas J. Lynch, assistant general manager and later general manager of the Schenectady Railway, Schenectady, N. Y., since July, 1923, has tendered his resignation, to take effect on May 1. Mr. Lynch came to the company from the United Traction Company, Troy division, living then, as he does now, in Albany. At the time of the reorganization of the company last October Mr. Lynch was requested to remain and did so, though at some sacrifices to his personal interests. For the present Mr. Lynch is devoting his time to personal interests which he has in his home city and will later announce plans which he now has under consideration.

## Mr. Danforth Resigns

R. E. Danforth has resigned as vice-president and general manager of the Public Service Railway, Newark, N. J. Mr. Danforth has been spending the winter in South Carolina and expects to take an extended vacation before engaging again in active business. During Mr. Danforth's absence M. R. Boylan has been acting general manager of the Public Service Railway.

**Frank Hampshire** has been appointed master mechanic of the Binghamton Railway, Binghamton, N. Y. In that capacity he succeeds H. M. Rhoda, who left the company on March 1 to take up duties under Charles S. Banghart, vice-president of the Richmond Light & Railroad Company, Staten Island, N. Y. Mr. Hampshire was first employed by the Binghamton Railway in November, 1907, as a night car cleaner. He was promoted to the day force as a car repairer during the spring of the following year, and in August, 1916, became night carhouse foreman. He resumed repair work within a couple of months and became assistant master mechanic to Mr. Rhoda in February, 1917. He remained in that capacity until Mr. Rhoda resigned March 1. Mr. Hampshire is an Englishman by birth.

## H. H. Couzens to Brazil

### General Manager of Toronto Transportation Commission Appointed to Canadian Holding Company

H. H. Couzens, general manager of the Toronto Transportation Commission, operating the civic railway lines in Toronto, and the Toronto Hydro, is to become vice-president of the subsidiary companies of Brazilian Traction, Light & Power Company, controlled by Canadian interests. He will make his headquarters at Rio de Janeiro.

Since Mr. Couzens assumed the duties of his present position, Sept. 1, 1921, Toronto's transportation system has been almost entirely rehabilitated. When the city took over the lines of the Toronto Railway the system was in exceedingly bad physical shape due to neglect during the purchase negotiations. Under the leadership of Mr. Couzens the Transportation Commission at once began the work of rehabilitation.

H. H. Couzens

Born in England in 1877, Mr. Couzens received his education at the Independent College at Taunton, England, after which he served as a pupil in mechanical and electrical engineering with Allen & Sons, Taunton, and the Taunton Corporation Electrical Works. After holding a number of engineering positions he became manager and engineer of the West Ham Corporation Electric Supplies in 1909, and three years later accepted a similar position with the Hampstead Borough Council. He held the latter position only one year, resigning at the end of 1912 to become general manager of the Toronto Hydro-Electric system, with which he took up his duties early in 1913. He continued in the latter position until the Toronto Transportation Commission took over the local street railway, when he assumed his present work.

At the concluding meeting of the Canadian Electric Railway Association, held on June 30, 1923, at Toronto, Mr. Couzens was elected president of the association.

Sir Alex. Mackenzie is president of Brazilian Traction, Light & Power Company and Messrs. E. R. Wood, R. C. Brown and Miller Nash of Toronto are among the vice-presidents. Sir Henry Pellatt and Sir Thomas White are among the directors. The company was formed to link the São Paulo Tramway, Light & Power Company, Rio de Janeiro Tramway, Light & Power Company, and São Paulo Electric Company. It also controls the Brazilian Telephone Company.

## Personnel Changes at Knoxville

The Knoxville Power & Light Company, Knoxville, Tenn., has promoted two of its officers and has transferred the office of the treasurer of the company to New York City. H. C. Ray, formerly assistant treasurer, has been elected treasurer, due to the resignation of C. J. Pleming, who will engage in private business. Mr. Ray will conduct the affairs of the office of treasurer in New York.

Chester A. Briggs, present auditor of the company, has been elected secretary and in addition to the duties of his new office will retain his old position.

Jesse W. Bye, Jr., was elected to the position of assistant treasurer. He has formerly been cashier of the company and will continue to remain in Knoxville.

H. U. Wallace, formerly assistant general manager of the Arkansas Central Power Company, Little Rock, Ark., has been appointed assistant general manager.

Frank J. Jones, formerly engineer way and structures, has been appointed chief engineer to succeed James Link, who has been transferred and appointed superintendent of the electric department.

**H. M. Rhoda**, formerly master mechanic of the Binghamton Railway, Binghamton, N. Y., resigned from that property on March 1 to take up duties under Charles S. Banghart, vice-president of the Richmond Light & Railroad Company, Staten Island, N. Y. At one time Mr. Rhoda was master mechanic of the Long Island Electric Railway, Jamaica, L. I. and prior to that served in the capacity of assistant master mechanic of the Reading Transit Company, Reading, Pa. He was also at one time identified with the Trenton & Mercer County Traction Corporation.

# Obituary

## John W. Boyle

John W. Boyle, Utica, N. Y., a pioneer operator of electric railway properties in central New York, died suddenly on March 27 in Los Angeles. It was in 1886 that Mr. Boyle first became interested in street railroad management when he filled the position of attorney for the Utica Belt Line, then just organized. Later when the Thomson-Houston Company secured control in 1889 he was made vice-president and general attorney. In 1894, upon the reorganization of the line, which he brought about, he was made president. Mr. Boyle disposed of his interests in the Utica Belt Line Street Railroad in 1901 and retired from the company. He first practiced law in Utica with Waterman & Hunt, but later followed his profession without a partner. He was born in Scotland in 1851.

# Manufactures and the Markets

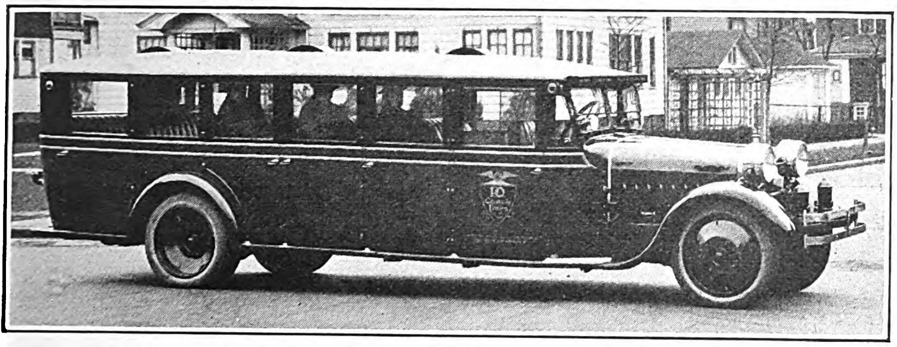
News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

## Bus Market Active

### Forty-two Vehicles for Akron—Railway Bus Purchases Approximating $2,000,000 Are Indicated

Contracts just placed by the Northern Ohio Traction & Light Company, Akron, Ohio, for $300,000 of automotive equipment again focus attention on the constantly increasing use of the bus by the electric railways. As noted elsewhere in this issue that order includes forty-two vehicles. In it are included Whites, Macks, Reos and Masons. Moreover, part of the equipment is intended to be used in city service and part in interurban.

This in itself is more significant, perhaps, than would at first appear, although so far as the Northern Ohio Company is concerned it does not mark a new departure in its practices. That order properly is regarded as mighty significant. It is. But after all, it stands apart as news largely because it bulks big as a single order. It is only one of many noted recently in the ELECTRIC RAILWAY JOURNAL. That record is not complete. It does not pretend to be. But it is a pretty fair criterion. Moreover, the trend which it indicates toward the constantly growing use of the bus by the railways is substantiated by the reports from the manufacturers themselves with respect to inquiries for buses.



Duplicate of Cleveland Automobile Show Job Just Delivered to the Pennsylvania-Ohio Electric Company

Among the large prospective orders is one in connection with the Philadelphia Rapid Transit Company bus development. It is understood in this connection that the company is likely to buy about 120 vehicles. It is understood that the Trenton, Bristol & Philadelphia Street Railway is considering the purchase of five or ten vehicles. The Washington, Baltimore & Annapolis is understood to be considering the purchase of buses. Another company in the East reported likely to be in the market is the Atlantic Coast Electric Railway, now included in the system of the Eastern New Jersey Power Company. The Third Avenue Railway, New York, is also understood to contemplate the purchase of five buses. The New Bedford Street Railway has recently purchased two Whites and one Mack and is reported to be in the market for additional vehicles.

Among orders reported placed are five Garfords and one Yellow Coach for the Springfield Street Railway, Springfield, Mass.; ten Fageols for the Trenton & Mercer County Traction Corporation in addition to three already delivered; five Garfords for the Chicago, South Bend & Northern Indiana Railway; six Fageols for the Indiana, Columbus & Eastern Traction Company and six Yellow Coaches for the Houston Electric Company.

This last is among the jobs already delivered. The Houston buses will seat twenty-nine passengers. They will be used in service put in operation to replace jitneys under the terms of the recent settlement ordinance there.

As for other orders completed the White company reports a brand new DeLuxe job just delivered to the Pennsylvania-Ohio Electric Company at Youngstown. This is a duplicate of "Miss Rosalie," the White bus displayed in the Cleveland Automobile Show. The body was built by Bender. The White company also reports having just delivered nine new jobs to the P-O—the DeLuxe coach just mentioned, and eight city pay-enter type that will go into the service of the Youngstown Municipal Railway. The P-O also has ten city pay-enter White buses on order. The White company also figured in the Akron order to the extent of ten model 50-A buses with Kuhlman bodies. These buses will go into service in Akron, making a total of 34 White buses being operated by the N.O.T.L. in the city of Akron and a grand total of 54 Whites in the service of that railway company.

There is no need to repeat at this time the figures of the JOURNAL with respect to its recent automotive survey for 1923. Significant as was that record of the trend of events with respect to the increased use of the bus by the railways, it appears to have been very conservative in the face of the development so far this year of which there is definite knowledge.

## G. E. Has Good Year

### Sales for 1923 Increased Nearly $30,000,000—Unfilled Orders at End of 1923 $87,112,000

Orders received by the General Electric Company during the year 1923 were $304,199,746, compared with $242,739,527 in the year 1922, an increase of 25 per cent. The profit available for dividends for 1923 was $33,525,118 and the surplus after cash dividends $18,579,423. The surplus as of Dec. 31, 1923, was $82,762,095. The surplus in 1922 in excess of cash dividends was $12,157,391. Unfilled orders at the end of 1923 were $87,112,000, compared with $76,220,000 in 1922.

#### EXPORT BUSINESS GOOD

The export business is conducted by the International General Electric Company, Inc. The total of all orders received by the International Company during the year was $21,743,000, compared with $21,536,000 during 1922. The net sales billed were $22,371,526 during 1923. The International Company's business was conducted at a profit available for dividends of $2,469,463, compared with $2,265,477 in 1922. Dividends of $700,000 were paid during 1923, of which the General Electric Company received $669,372.

During the year distinct notable improvements were made in internal rearrangement and production processes and methods, which, notwithstanding increased cost of labor and material, have resulted in lower costs, and these have been reflected from time to time in reduced selling prices.

One of the most important new investments of the year was the purchase of a majority of the common stock of the Canadian General Electric Company, Limited. It is the intention to preserve essentially the Canadian character of this company.

#### IMPORTANT MECHANICAL ADVANCES MADE

Inventories in factories and warehouses and on consignment have been valued at cost or market, whichever was lower. After deducting adequate reserves, they are carried at $83,746,031 compared with $75,334,561 at the end of 1922.

Notes and accounts receivable are carried at $37,987,339, compared with $35,154,419 at the end of 1922. Collections were good and credit losses very small.

The cash balance, including temporary investments in short term obligations of the United States Government, was $91,205,620 at Dec. 31, as compared with $85,341,538 at the close of the previous year. The company has no notes payable, or any obligations bearing its indorsement outstanding.

In carrying out the provisions of the Charles A. Coffin Foundation various awards were made. Thus in October, 1923, the committee of the American Electric Railway Association awarded the Charles A. Coffin medal to the Chicago, North Shore & Milwaukee Railroad and $1,000 to the Employees Mutual Benefit Association of that company. In this connection the company expresses the hope that the awards of the Charles A. Coffin Foundation for achievements on the part of companies and individuals will serve as appreciation and recognition of meritorious and distinguished service to the electrical industry.

The company reports important progress during the year from the work of the engineering department and research laboratory. In addition to the improvement of existing designs many new designs have been developed and placed on the market. These include standard lines of induction motors, steam turbines up to 60,000 kw. capacity, designed for steam pressure of 600 pounds, superheated to a temperature of 750 degrees F., and special turbines for 1,200 pounds steam pressure.

The Emmet mercury vapor process has been installed and is in successful operation at the power house of the Hartford Electric Light Company. This system is regarded to represent an important improvement in prime mover efficiency over present standard steam boiler and turbine practice.

## *Rolling Stock*

**Pacific Electric Railway, Los Angeles, Cal.**, has purchased 1,350 additional freight cars for $3,000,000, with delivery specified at the rate of 150 cars average per week. The first lot of the new freight cars will probably be received early in April. This order is a little more than twice the size of a contract for freight equipment made during the past year. The final delivery of this 650-car order has just been completed. The total expenditure for freight equipment by the company the past year was $4,950,000.

## East St. Louis Company Improving Shop

As part of a general program for modernizing its shop equipment, the East St. Louis & Suburban Railway, East St. Louis, Ill., has made a number of improvements to existing facilities and added a number of new machine tools. Individual motor drive is being gradually installed to replace line shafts and belt equipment. It is expected that by the end of the current year practically all of the machinery in the Win Stanley shop will be individually motor driven.

A new 48-in. swing, double-head wheel lathe has been added for turning steel wheels. In the machine shop a motor-driven hacksaw which was recently installed has proved to be particularly useful. A molding machine has been added in the wood mill and a new electric welder has been added for reclaiming broken or worn parts.

In addition, a survey of the pipe work which is required in the routine maintenance of equipment has led to the installation of a new motor-driven pipe cutting and threading machine. It is expected that the addition of this machine will save not only a large part of the time and labor incident to threading the large amount of pipe used for maintenance work, but will also make a considerable saving.

## *Track and Line*

**Madison Railways, Madison, Wis.**, has completed preparations for the double tracking of nearly the entire length of its Wingra Park-Fair Oaks Street line. Soon double tracking and paving work will start from Regent Street on Breeze Terrace to University Avenue, thence down University Avenue to Chester Street. On University Avenue the tracks will be lowered to conform with the present grade.

**Wisconsin Valley Electric Company, Wausau, Wis.**, has been petitioned by property owners on the northwest and east side sections of the city to construct a loop north of Clarke Street.

**Fresno Interurban Railway, Fresno, Cal.**, has received permission from the commission to construct its track at grade across Academy, Madsen, Newmark, Zediker and Riverbend Avenues in the County of Fresno.

**Pacific Electric Railway and Southern Pacific Railroad, Los Angeles, Cal.**, have announced that plans have been completed for a proposed expenditure of $1,750,000 to construct a huge joint freight classification and distribution yards at Watson Station on the Los Angeles-San Pedro Line.

## *Trade Notes*

**Charles Longenecker**, formerly sales engineer with the Bonnot Company at Canton, Ohio, has become associated with the Combustion Engineering Corporation, 43 Broad Street, New York. Mr. Longenecker was one of the first men to specialize in pulverized fuel and he has been active in this field for many years past. His efforts have been directed particularly along the line of industrial application to both boilers and furnaces. In this new connection he will be identified with the recently created industrial department of the Combustion Engineering Corporation. This department, in charge of H. D. Savage, will specialize in the application of pulverized fuel to industrial work of all kinds.

**William Arthur** has arranged with J. M. Pneuman to represent in the Midwest territory the Arthur Power-Saving Company, of which he is general manager. As reported in the March 29 issue of ELECTRIC RAILWAY JOURNAL, J. M. Pneuman has entered the commercial field as manufacturers' agent for electric railway supplies and equipment, operating from Berea, Ohio, near Cleveland. The Arthur Power-Saving Recorder Company is at New Haven, Conn. More than 12,000 of the Arthur power-saving recorders are now in use. Recent improvements in the apparatus have made them dust-proof and tamper-proof. Further, all hand winding of the clock mechanism has been eliminated, as the process is now entirely automatic.

## *New Advertising Literature*

**The Johns-Pratt Company, Hartford, Conn.**, has issued a circular called "Going Underground?" It states that more than 1,200 different kinds of Noark underground boxes have been produced.

**James H. Channon Manufacturing Company, Chicago, Ill.**, has issued a pamphlet on Sherardizing "the most modern and thorough method of rust-proofing in use today."

## ELECTRIC RAILWAY MATERIAL PRICES—APRIL 1, 1924

### Metals—New York

| | |
|---|---|
| Copper, electrolytic, cents per lb. | 13.562 |
| Lead, cents per lb. | 8.975 |
| Nickel, cents per lb. | 26.00 |
| Zinc, cents per lb. | 6.50 |
| Tin, Straits, cents per lb | 50.25 |
| Aluminum, 98 to 99 per cent, cents per lb. | 27.50 |
| Babbitt metal, warehouse, cents per lb.: | |
| Fair grade | 60.00 |
| Commercial | 28.00 |

### Bituminous Coal

| | |
|---|---|
| Smokeless mine run, f.o.b. vessel, Hampton Roads | $4.20 |
| Somerset mine run, Boston | 2.125 |
| Pittsburgh mine run, Pittsburgh | 2.125 |
| Franklin, Ill., screenings, Chicago | 2.075 |
| Central, Ill., screenings, Chicago | 1.675 |
| Kansas screenings, Kansas City | 2.50 |

### Track Materials—Pittsburgh

| | |
|---|---|
| Standard Bessemer steel rails, gross ton | $43.00 |
| Standard open hearth rails, gross ton | 43.00 |
| Railroad spikes, drive, Pittsburgh base, cents per lb. | 3.00 |
| Tie plates (flat type), cents per lb. | 2.60 |
| Angle bars, cents per lb. | 2.75 |
| Rail bolts and nuts, Pittsburgh base, cents, lb. | 4.125 |
| Steel bars, cents per lb. | 2.30 |
| Ties, white oak, Chicago, 6 in.x8 in.x8½ ft. | $1.70 |

### Hardware—Pittsburgh

| | |
|---|---|
| Wire nails, base per keg | 3.00 |
| Sheet iron (28 gage), cents per lb. | 3.75 |
| Sheet iron, galvanized (28 gage), cents per lb. | 4.90 |
| Galvanized barbed wire, cents per lb. | 3.80 |
| Galvanized wire, ordinary, cents per lb. | 2.75 |

### Waste—New York

| | |
|---|---|
| Waste, wool, cents per lb. | .15 |
| Waste, cotton (100 lb. bale), cents per lb.: | |
| White | 12–18 |
| Colored | 9–14 |

### Paints, Putty and Glass—New York

| | |
|---|---|
| Linseed oil (5 bbl. lots), per gal. | $0.93 |
| White lead (100 lb. keg), cents per lb. | 12.25 |
| Turpentine (bbl. lots), per gal. | $1.01 |
| Car window glass, (single strength), first three brackets, A quality, discount* | 84.0% |
| Car window glass, (single strength), first three brackets, B quality, discount* | 86.0% |
| Car window glass, (double strength) all sizes, A quality, discount* | 85.0% |
| Putty, 100 lb. tins, cents per lb. | 4–6 |

*These prices are f.o.b. works, boxing charges extra.

### Wire—New York

| | |
|---|---|
| Copper wire base, cents per lb. | 16.00 |
| Rubber-covered wire, No. 14, per 1,000 ft. | $6 75 |
| Weatherproof wire base, cents per lb. | 18.00 |

### Paving Materials

| | |
|---|---|
| Paving stone, granite, 4x8x4, f.o.b. | |
| Chicago, dressed, per sq.yd. | $3.60 |
| Common, per sq.yd. | 2.95 |
| Wood block paving 3½, 16 treatment, N. Y., per sq.yd. | 2.56 |
| Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots | 54.00 |
| Crushed stone, ¾-in., carload lots, N. Y., per cu.yd. | 1.85 |
| Cement, Chicago consumers' net prices, without bags | 2.20 |
| Gravel, ¾-in., cu.yd., f. o. b. N. Y. | 2.00 |
| Sand, cu.yd., N. Y. | 1.25 |

### Old Metals—New York and Chicago

| | |
|---|---|
| Heavy copper, cents per lb. | 10.75 |
| Light copper, cents per lb. | 9.25 |
| Heavy brass, cents per lb. | 6.75 |
| Zinc, old scrap, cents per lb. | 4.00 |
| Yellow brass, cents per lb. (heavy) | 6.00 |
| Lead, cents per lb (heavy) | 7.25 |
| Steel car axles, Chicago, net ton | $18.25 |
| Cast iron car wheels, Chicago, gross ton | 17.25 |
| Rails (short), Chicago, gross ton | 18.75 |
| Rails, (relaying), Chicago, gross ton | 26.50 |
| Machine turnings, Chicago, gross ton | 8.75 |

New York, April 12, 1924

# Electric Railway Journal

*Consolidation of Street Railway Journal and Electric Railway Review*
Published by McGraw-Hill Company, Inc.
HENRY W. BLAKE and HARRY L. BROWN, *Editors*

*Volume 63*
*Number 15*

## Rehabilitation of Property Increases Patronage

COMPARATIVE figures for the same months of this year and last year show an increase of $14,000 in revenue for the city lines of Aurora and Elgin. These lines are part of the recently rehabilitated and reorganized Aurora, Elgin & Fox River Electric Company, the work of reconstruction having been started during last year. It is safe to say that the increase in patronage was due in large part to this work. While the public may appreciate a change in policy or management, changes with which they come in direct contact in their use of the lines, such as new cars and improved running time, are what cause people to talk favorably about the company and bring increased riding. Promises and publicity and advertising cannot produce results comparable with those that come from notably improved transportation.

In the case of the Aurora, Elgin & Fox River Electric Company, the people not only reciprocated with unprecedented patronage but in addition granted unusual franchises which relieved the company of unpaid past and future paving obligations. These two manifestations on the part of the riding public serve to indicate that the inhabitants of the Fox River Valley want, and will pay for, good electric railway transportation. Faith in this is evidenced by the fact that a power company purchased the property through the bankruptcy court.

Incidentally, 98 per cent of the stockholders of the holding company live in the territory served by the railway, which also, no doubt, is an important factor in the interest shown by the public in giving the railway a fair chance to serve. So reorganization of this property will probably shortly place it on a firm earning basis.

## City Officials Should Take Unto Themselves Some of the Shortcomings of Car Service

A FAVORITE sport of city officials in many places is to criticise bitterly the quantity and quality of service supplied by the local street railway. In so doing they no doubt imagine that they strike a popular chord. Perhaps they do sometimes, for every one has experienced at one time or another vexatious delays waiting for cars and tedious trips through congested traffic after boarding cars. A fact which the city officials are likely to overlook, however, is that they are often largely responsible for such shortcomings of the transportation service.

The two major causes of public displeasure are gaps in the headway and slow speed of operation. As long as the railway service is regular and fast the public will be satisfied. Of course, attractive and commodious cars are preferred, and the passengers dislike to be too closely crowded. There is, therefore, occasional clamor for better cars and more of them. But the fact is that scheduled headways are nearly always sufficiently short to handle the traffic properly if they are maintained. If delays and interruptions to service are largely eliminated criticism of the railway will die out.

Unfortunately the power to accomplish this end does not lie entirely in the hands of the railway. More delays are caused by conditions for which city officials are responsible than are caused by conditions for which the traction company is responsible. The number of delays resulting from such causes as vehicles traveling in the tracks, vehicles parked so that street cars cannot pass, vehicles becoming stalled on the track, slow or careless traffic officers, are more numerous than delays caused by mechanical or electrical failures of the railway equipment.

Moreover, railway operation is slowed down perhaps as much by the failure of public officials to abolish parking or to enforce existing parking regulations, and by the necessity to make unnecessary stops, as by passenger interchange. City officials would accomplish more by co-operation with the railway to eliminate delays and speed up the service than they do by criticism for public effect.

## Express Service with Bus Locals May Increase Earning Power

IN THESE days of intensive use of facilities it is necessary to do everything possible to increase the productivity of the electric railway plant. If the cars can be speeded up the track is released that much more quickly for other cars, and the carrying capacity is increased accordingly. The greater speed naturally enhances the value of the service to the rider, so that more business can be looked for, provided, of course, the service is good in other respects.

How to get the increased speed is one of the most difficult problems with which a management has to contend. Nowadays every element seems to be working against speed, rather than for it. Only those who have tried to inaugurate modernization programs involving faster schedules know how difficult it is to get the cars moving and to keep them moving at a satisfactory rate.

Express service is one answer that is proposed frequently as a means of obtaining better schedules. Ordinarily its introduction necessitates that an entire street be given over to the express cars, as few systems have any means of passing one car around another. In a few cases local cars can be turned out at a junction to let the express cars by, but this is a wasteful procedure, and all the advantage gained by the fast car may easily be lost by the slow one that has to turn out.

A plan that obviates these difficulties and really gives fast express service is that inaugurated in Providence, R. I., using electric cars for the express line and a motor bus line paralleling them on the same street for the local traffic. This method, which was described in ELECTRIC RAILWAY JOURNAL for March 15, page 511, has worked out to the satisfaction of the company and of the public. Where the greater part of the business is carried on the express line, and the local service demanded is relatively small, the method has advantages that indicate it may be applicable to other localities. The car, which is the more economical unit to operate, has the right of way and can travel at a comparatively high speed, reducing operating costs. Stops are relatively infrequent, so that a more comfortable service can be provided and the schedule more readily adhered to.

The bus, on the other hand, can draw up to the curb to stop for passengers, so that the advantages of this factor are obtained for the short rider who otherwise might not patronize the transportation system. On account of the smaller vehicle capacity, frequent service can be given to attract business. Co-ordinated in this manner, each class of vehicle is doing its best as a part of a system.

The advantages of such a plan are so obvious that it will be well if operators will look into it closely where there is a demand for both fast express service and frequent local service. As a feature of the modernization program it certainly is worthy of attention, if nothing more. And incidentally, this bus service in Providence is paying, and so is the railway line.

## Company Publications Perform a Real Service to the Industry

INDIVIDUAL managements that are sponsors for employee magazines know the benefits that accrue to them through these publications. If this were not so the number of such publications would not have grown so rapidly as it has in the past few years.

There is another side to the matter, however. It is the industry side. In this connection an important work is being done by these publications in assisting the employees to realize the part they can play in helping to build for the company and the industry the good will of the citizens. They learn that in furthering the affairs of the companies they are strengthening their own positions, for the well-being of the industry, of the company and the employees are closely linked.

The measure of merit of these company publications does not vary greatly. It would indeed be difficult for a jury of competent judges to say which, if any, is the best. It is frequently a source of wonder, however, whether managements and men fully realize the amount of work that goes into the making of these publications. They show up unobtrusively but regularly, filled with accounts of matters that are for the most part of greater interest than we realize in the lives of the men and women of the company. It is only human to take casually things that pass before one day by day. As a result, sight is often lost of the measure of merit behind performances seemingly routine, but costly in the amount of thought, effort and time put into them.

For the benefit of managements that have recently established publications of their own, it might be well to say that of the older employee magazines, those that are performing their functions best are the ones that are edited by men who have the sympathetic support and the inspirational direction of their executives. However capable the man may be to whom is intrusted the job of getting out a company publication, the work is only just begun with the hiring of the man who is to do the editing. He cannot make the magazine do what is desired of it unless the executive makes it a point to give him the background for executive decisions and to lead him in putting the spirit of the management into the publication so that it may permeate the more quickly through the entire organization.

## The Paris Convention Would Interest Americans

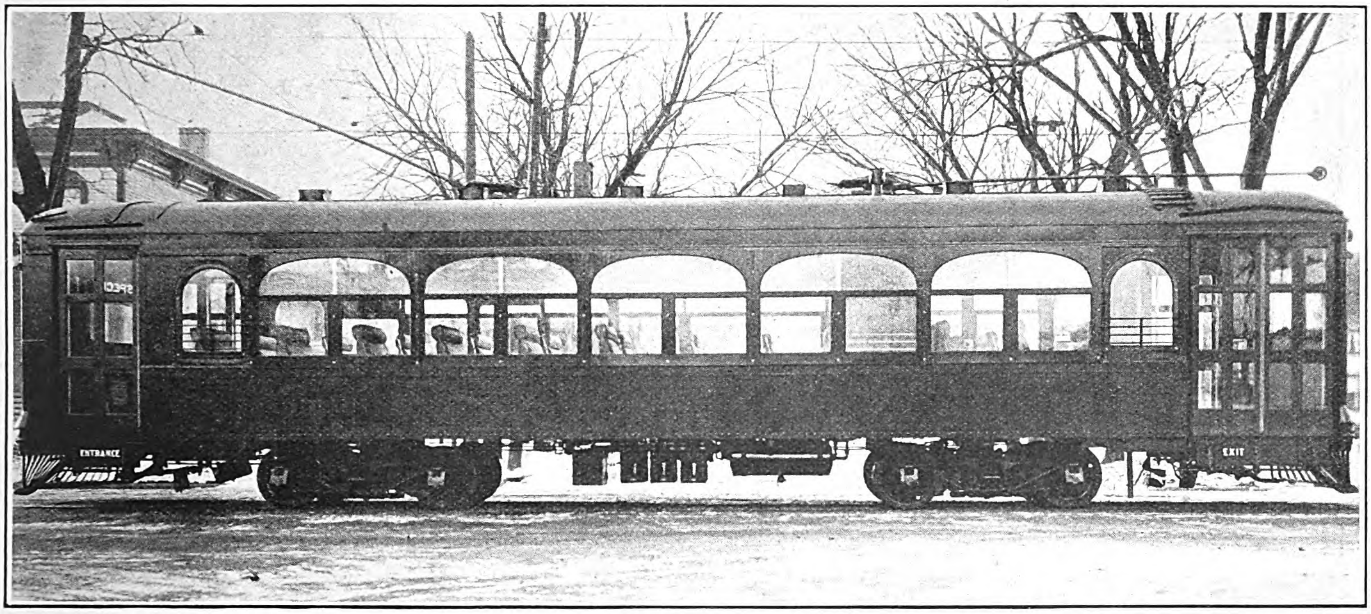
IT IS fortunate for electric railways that so much of their practice is the same all over the world. This is due largely to the fact that the industry is quite a modern one. The first commercial railways were put in operation only a little more than thirty years ago. Their engineering development has followed along much the same lines in its major aspects. Partial standardization of equipment has also come about through the fact that the larger manufacturing companies in this country are also well established in Europe and have supplied much of the apparatus used on European electric railways. The same broad economic trends have affected the earnings of European tramways in the same manner as American electric railways. So it is not surprising that many of the problems with which American electric railway companies have to contend are faced also by the European companies. No doubt much can be learned by a free exchange of information such as comes with personal conference.

The forthcoming convention of the International Electric Railway Association, to be held in Paris June 16-22, affords an opportunity for such discussion, and its program, as published in the issues of this paper for Jan. 6 and March 29, indicates that many topics of interest to railway men in this country will be considered. Letters of invitation from the international association to President Budd and Secretary Welsh of the American Association show that American railway men will be welcomed at the Paris meeting.

It might be said that the international association, officially known as Union Internationale de Tramways, de Chemins de Fer d'Intérêt Local et de Transports Publics Automobiles, has a very long and honorable record as well as name. It was established in 1885, or only three years after the American Association. It has held annual (or more recently biennial) sessions ever since, in different countries in Europe, except between 1914 and 1920. The international character of the association is shown by the fact that its executive committee includes representatives from France, Belgium, Spain, Italy, Switzerland, Holland, Denmark, Poland and Norway.

The association possesses a somewhat more official character than the association in this country, owing probably to the closer governmental connections with street and interurban electric railways in most European countries than in the United States. In consequence, at each of the conventions, delegates officially representing the different governments are in attendance.

This short explanation is given for the benefit of those American railway managers who may be in Paris in June. Railway men often take trips abroad, and if those who go this summer can arrange to include attendance at the Paris meeting, they will find it eminently worth while.

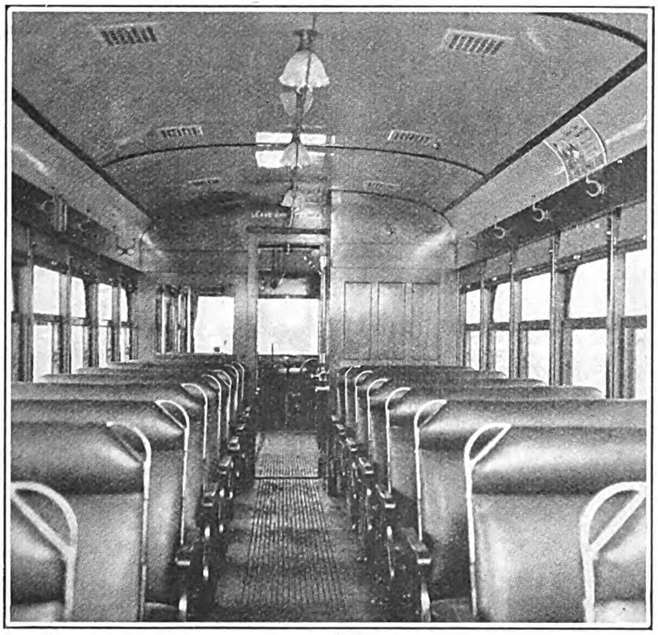


New Light-Weight, Low-Floor, One-Man, Two-Man Interurban Cars Purchased to Operate Between Aurora and Elgin

# Rehabilitated Property Attracts Increased Patronage

**Aurora, Elgin & Fox River Electric Company Lines Re-equipped as to Cars and Power Facilities—Part of Aurora, Elgin & Chicago Railroad Released from Receivership Through Purchase by Local Power Company—New Franchises Relieve Company of Paving Burden**

EXTENSIVE rehabilitation, accomplished in five months' time, has transformed the bankrupt Aurora, Elgin & Chicago, Fox River division, into a modern electric railway property. So complete has been the change that even the name was lost during the transition, and the Aurora, Elgin & Fox River Electric Company has little else other than the track to remind it of the days of the receivership.



Arched Headlining, Shaded Lamps, Fabrikoid Seats in New Interurban Cars

The system is now owned and controlled by the Western United Corporation, a holding company of Aurora, of which Col. I. C. Copley is president. New cars, new substations, and new management have served to sell rides to the people of Elgin and Aurora and the Fox River Valley, who are supplying an unprecedented patronage.

This property, and the third-rail division of the Aurora, Elgin & Chicago Railroad, were operated jointly, as previously, under the same receivership from Aug. 9, 1919, to March 1, 1922. On this latter date the bondholders of the Fox River division, comprising the city lines in Aurora, the city lines in Elgin, and the interurban connecting the two towns, petitioned and obtained a separate receivership. Oscar Nelson was named receiver, B. P. Alshuler was appointed attorney for the receiver, and J. F. Egolf, general manager. It was during this receivership, which terminated on Jan. 1, 1924, with the purchase of the property by the present owners, that these improvements were made.

Old equipment and unreliable operation had caused most of the dissatisfaction and misunderstanding between the public and the company. Certain obligations and promises had not been kept, with the result that the new management's first task was to re-establish confidence with the public. The trainmen were brought together at suppers and entertainments so that their co-operation might be enlisted in carrying out the new policies of the management. A voluntary reduction in fares, both on the

city lines and on the interurban line, was put into effect. The old city fare of 10 cents cash and six tokens for 50 cents was changed to 10 cents cash and seven tokens for 50 cents. A 50-cent monthly card entitling bearer to ride for 5 cents, and a school children's rate of 30 rides for 90 cents, further reduced the average rate of fare. The interurban fare was reduced by offering a 25-ride coupon book between any two towns at a 2½-cent per mile rate. A 10 per cent reduction on round-trip tickets was also inaugurated.

These various measures helped to re-establish confidence between the company and the public, and within a year favorable consideration was given to the new franchises required in several cities.

### NATURE OF NEW FRANCHISES

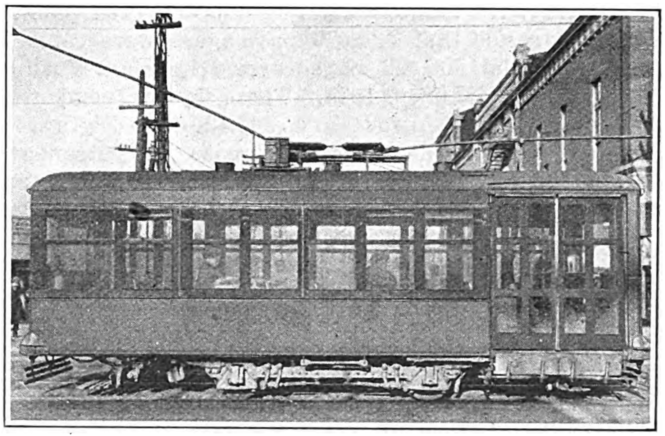
Because so many operating franchises had expired, the management found it advisable, when getting new franchises, also to revise other franchises having several years yet to run. At Aurora, a new franchise was drawn which frees the company from all future paving obligations. Similar franchises were adopted in Batavia and St. Charles, two small towns between Aurora and Elgin.

In Elgin, a different form of franchise was adopted. After meeting past paving obligations, the company is relieved of all paving and assessments for a period of five years. If at the end of this period the books of the company do not show an average of 6 per cent net return on the investment, the company is again relieved for a period of five years, and so on, throughout the duration of the 20-year franchise. If 6 per cent is made in one five-year period, assessment is to be made for the future five-year period and not for the past. In the meantime the city carries on the normal paving program.

At the time franchises were presented to the Councils or committeemen of these municipalities, Mr. Egolf explained that it was impossible to continue operations under the conditions stipulated in the old franchises. He told of the company's plan to purchase new equipment and to improve the property in general. The councilmen were thus given the opportunity of indorsing the new franchise and obtaining improved service or the alternative of rejecting it, thereby losing the advantages of electric railway transportation.

### NEW SAFETY CARS

New equipment was purchased after the conditions of operation had been settled. For city operation 40 single-truck, double-door, double-end, one-man safety cars were purchased from the St. Louis Car Company. These cars weigh 18,000 lb., seat 30, including four folding seats on the rear platform. The seats are of springless rattan construction, framed in cherry. The cars are mounted on St. Louis No. 7 light-weight trucks, equipped with 26-in. wheels and two G.E. 264, 25-hp. motors controlled by K-63-M double-end control. The two doors may be opened independently or together, giving a 4-ft. opening to the platform. One of the two stanchions on the platform is equipped with a bracket for holding a Cleveland fare box. The interior of the car is finished in cherry, with white enameled Agasote headlining. The exterior of the car is painted with "traction" orange striped in black. During the winter months the side windows are covered with storm sash, made up in three sections. These are of light framed construction and cover both the upper and lower sash. They are held in position by bolts fastened to the side posts, and are further secured at the top to the drip rail. Another winter accessory is the Root snow scraper and track groover.

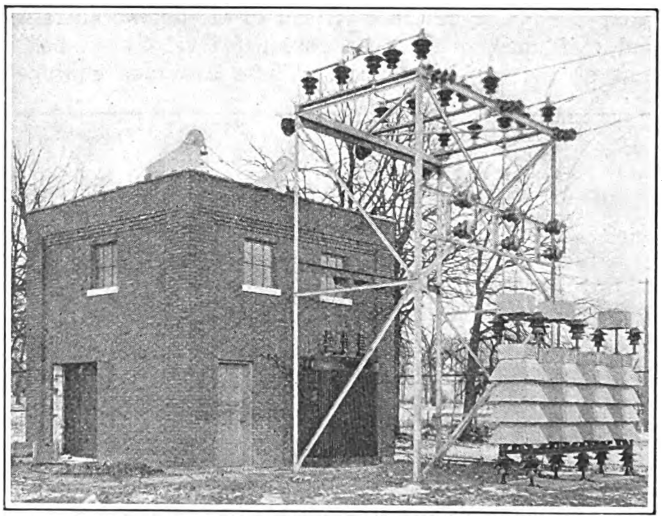


**New One-Man Safety Car Purchased for City Service in Aurora and Elgin. Storm Sash Cover Both Upper and Lower Sash of Side Windows in Winter**

These cars averaged 1.18 kw.-hr. per car-mile energy consumption for the first month of operation. They replaced 40,000-lb., two-man, three-step cars, which had been operated at an average of 3.2 kw.-hr. per car-mile energy consumption.

### CITY OPERATION IMPROVED

Twenty-four of the new cars have been placed in service in Aurora and sixteen in Elgin. Operation of city service was radically changed with the advent of the new cars. It was possible to increase the schedule speed from 8 m.p.h. to 10.4 m.p.h., which, with a greater number of cars, made possible a 10-min. headway rather than a 20-min. headway, as had been the case with the old equipment. In Aurora and Elgin frequent headway is a necessity because of the short distance between residence and business districts which invites walking if a car is not in sight. In Elgin a change in routing was effected by placing double tracks through the downtown portion of the city. This facilitated through-routing from one side of the city to the other and made possible a 12-m.p.h. schedule speed on a 12-min. headway, where the former schedule called for a 9-m.p.h. speed on a 20-min. headway. Improvements



**Type of Automatic Substation Installation Made at Batavia and at St. Charles. The Building Houses a 300-Kw. Unit**

in service were immediately recognized by the public, with the result that 434,470 passengers were carried in Aurora and 306,428 were carried in Elgin during the month of January, 1924. These figures, compared with 307,188 for Aurora and 246,120 for Elgin for January, 1923, indicate the increase in patronage. Comparing the same months, the revenue showed an increase in gross of $9,000 for Aurora and $5,000 for Elgin, making January, 1924, the best month the company has experienced.

### NEW LIGHT-WEIGHT INTERURBAN CARS

Shortly after the city cars were received, seven new light-weight, one-man, two-man, double-truck, interurban cars were delivered for operation on the line between Aurora and Elgin. These cars were also built by the St. Louis Car Company, and are of the straight-side, arch-roof type, mounted on 26-in. wheels and equipped with four G.E. 265, 35-hp. motors. Complete safety equipment similar to that of a safety car has been installed in order that this car may be operated by one man should the occasion demand. Each car seats 48 passengers on St. Louis Car Company's reversible interurban seats, which are full spring cushion and back type, covered with Fabrikoid. Above the upper sash, at each side post is a hat and coat hook. The interior trim is cherry. This and the white Agasote headlining give a very light, pleasing appearance. In place of a bulkhead, aluminum stanchions and railings separate the car body from the platform, allowing an unobstructed view from the seats through the front vestibule windows. A partition with swinging door divides the car into two compartments, one of which is used for smoking. A toilet has been provided in one corner of the main compartment.

Illumination of the car is accomplished by a row of 92-watt lamps with shades mounted on the headlining above the aisle. The platform areas are illuminated by five 32-watt lamps. Besides these lights, two emergency lamps are provided, operated from a 6-volt battery, for illuminating the interior of the car in case the trolley voltage fails. A thermostatically-controlled electric heater has been placed under each seat to maintain a temperature of 60 deg. F. Ventilation is taken care of by 12 St. Louis ventilators spaced six on each side of the roof.

A slight ramp in the aisle connects the floor of the body with that of the platform, and a transverse ramp from the center of the platform to the double entrance and exit doors makes the entrance level 3½ in. below that of the car body floor. These cars are equipped with safety devices and air-operated doors and step. A single folding door at the rear on the right-hand side, operated by hand, serves as an entrance when the car is operated by two men.

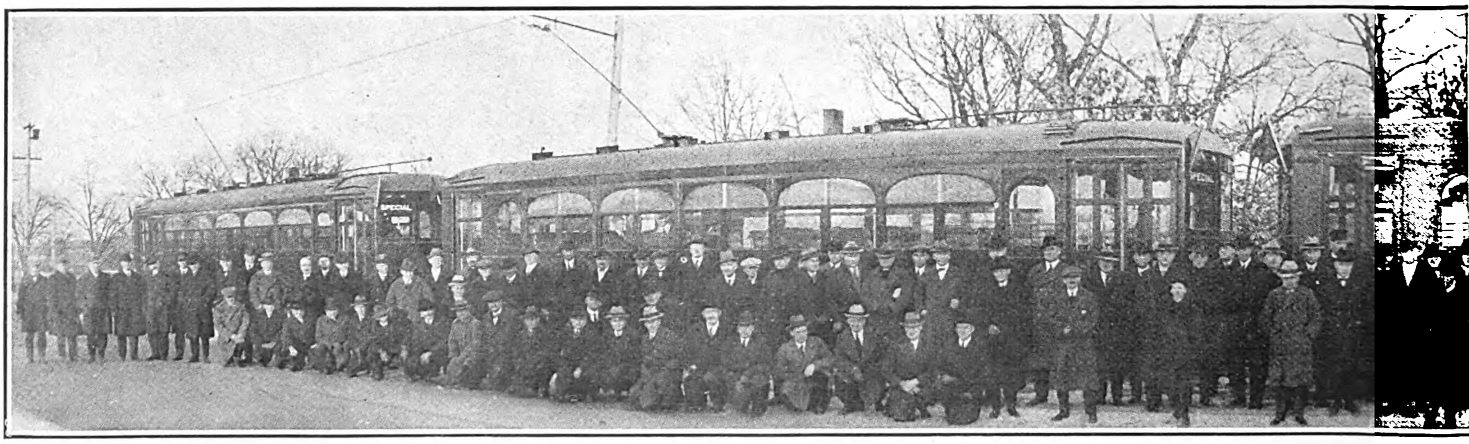
Streamline appearance has been obtained in the design by continuing the arch roof over the vestibules. Gothic shaped Florentine glass is used in the upper sash over each pair of windows, and an individual single sash window has been placed in each of the four panels at the corners of the car body. During the winter, storm sash made up in five sections cover both upper and lower sash, and are held in position by the drip rail at the top and by means of bolts at the belt rail and on the side posts. These are constructed of ¾-in. cherry with the upper portion shaped to conform with the design of the upper sash of the windows.

A set of two marker lights has been placed at each end of the car above the end windows on the vestibule corner posts. These serve as indicating markers on the front end of the car and as tail lights at the rear end. In normal operation each set of marker lights is illuminated by a lamp operating as part of a five in series circuit. In case of a power failure, illumination is supplied by a 6-volt lamp mounted beside the high-voltage lamp. These four low-voltage lamps, one in each marker box, with two lamps in the car interior, are operated from a 6-volt, 120-amp.-hr. storage battery located in the toilet. This battery is charged in series with the five marker lamps from the trolley voltage. A relay cuts in the 6-volt circuit automatically when the trolley voltage is off. This arrangement does away with oil lamps and lanterns for marking purposes, and at the same time insures protection in case the line voltage fails.

### NATURE OF INTERURBAN OPERATION

The interurban operation is more nearly suburban in character, because of the many adjoining small towns between Aurora and Elgin. In the 22 miles there are 50 regular stops, with 52 additional stops made on signal. During the day an hourly service is rendered, which is increased to 30 min. during the rush period. A schedule speed of 16½ m.p.h. makes it possible to complete the run in 1 hr. and 20 min.

The zone system of fare collection is employed, the distance between Aurora and Elgin being divided into 31 zones. No fare box or register is used, the conductor collecting the fare and giving a "hat check" receipt, upon which is some figure or mark designating the zone to which the passenger is entitled to ride. The checks are carried in holders mounted on each



"Selling" the Road to the Communities. One of the Interurban Parties Attended by the side post and are taken up by the conductor as the car passes through the zone preceding the one to which the passenger is entitled to ride. This system met with the disapproval of the passengers at first, because of the necessity of keeping the check in sight. The conductor is placed entirely on his honor in the handling of cash fares, and the company thinks that the system has worked out as satisfactorily as the more elaborate systems involving fare boxes and registers.

### POWER REQUIREMENTS

Power for the railway operation and for lighting purposes in Elgin had been obtained from the third-rail division of the Aurora, Elgin & Chicago Railroad. The contract under which the power was delivered expired on Jan. 1, 1924, and notification that this contract would not be renewed was sent to the Fox River division in November, 1922. Negotiations were immediately opened with the local power company at Aurora for the purchase of alternating-current high-voltage energy. A contract was closed for 10,000 kva. of 33,000-volt energy. As the capacity of the Aurora generating plant was such that it could not handle this load, two 7,500-kva. turbine-alternator units and the necessary boilers were purchased and mounted in an addition to the power company's plant. This more than doubled the capacity of the generating plant and involved an expenditure of more than $1,000,000, but was accomplished in the remarkably short time of five months.

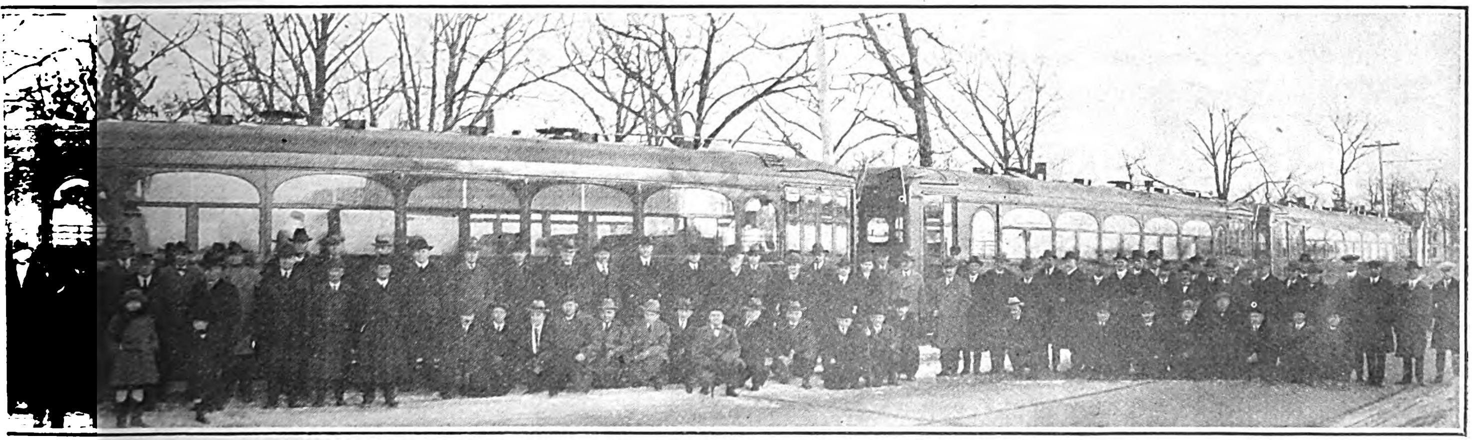
As the third-rail division had delivered the railway energy at 600 volts direct current, the Fox River division was not prepared to convert high-tension a.c. energy into 600-volt d.c. Consequently, the railway company was required to construct a three-phase high-tension pole line from the generating plant in Aurora to the distributing center in Elgin, a distance of 22 miles, with taps at St. Charles and Batavia for two d.c. substations.

At Elgin the railway company does a general lighting business, supplying the city with both d.c. and a.c. energy for light and power purposes. This energy had been purchased at the proper voltage for distribution. With the advent of the 33,000-volt line from Aurora it was necessary to construct a building to house two 500-kw. hand-operated rotary converters for the railway power requirements, two 300-kw. motor-generator sets for d.c. commercial power requirements, and the necessary regulators and switchboards for operating the station as a power and lighting distributing center. The power transformers, regulating transformers, oil switches and lightning arresters have been mounted in the yard to the rear of the building. The building installations were completed in five months, the new equipment going on the line on Dec. 28, 1923, just three days before the contract with the third rail division expired.

Trolley voltage is maintained by two 500-kw. hand-operated rotary converters mounted in the addition to the power plant at Aurora, two 500-kw. hand-operated machines in the distributing center at Elgin and two substations along the interurban line, one at St. Charles and one at Batavia. Each of these installations is of 300-kw. capacity with full automatic control. The rotary and switchboard are housed in the conventional type of brick building with ventilators on the roof and louvers in the walls near the floor level. The high-tension feed for each substation is carried on a steel framework, which supports the fuse and choke coil for each phase. This framework, the lightning arresters and transformer are mounted in the yard adjacent to the building. The transformer is connected to the line at all times and is protected by choke coils, while the line in turn is protected by a high-tension fuse in each phase. An aluminum lightning arrester is connected to each phase through a disconnect switch. These substations, the distributing center at Elgin and the power plant addition at Aurora were equipped by the General Electric Company.

### FINANCED BY LOCAL MONEY

The Western United Corporation, the holding company of the Western United Gas & Electric Company, the local power company at Aurora, became interested in the railway property and purchased it through the bankruptcy court. The outstanding obligations of the railway company are: $2,500,000 of preferred stock, $2,500,000 of common stock, and $250,000 surplus replacement reserve. All of the new equipment was purchased on money obtained through the sale of receivers' certificates, which have since been refunded by bonds of the new company. There are 3,000 stockholders of the holding company; that is, the Western United Corporation, and of this number 98 per cent live in Aurora or the adjoining territory. The local bond houses and banks of Aurora handle all of the finances of the corporation. This places the railway property on a customer-ownership basis, whereby the public, through ownership of stocks and bonds, furnishes the capital for rehabilitation work and in turn derives a return on the investment in the form of dividends and service.



City Councils of All of the Municipalities Through Which the New Cars Operate

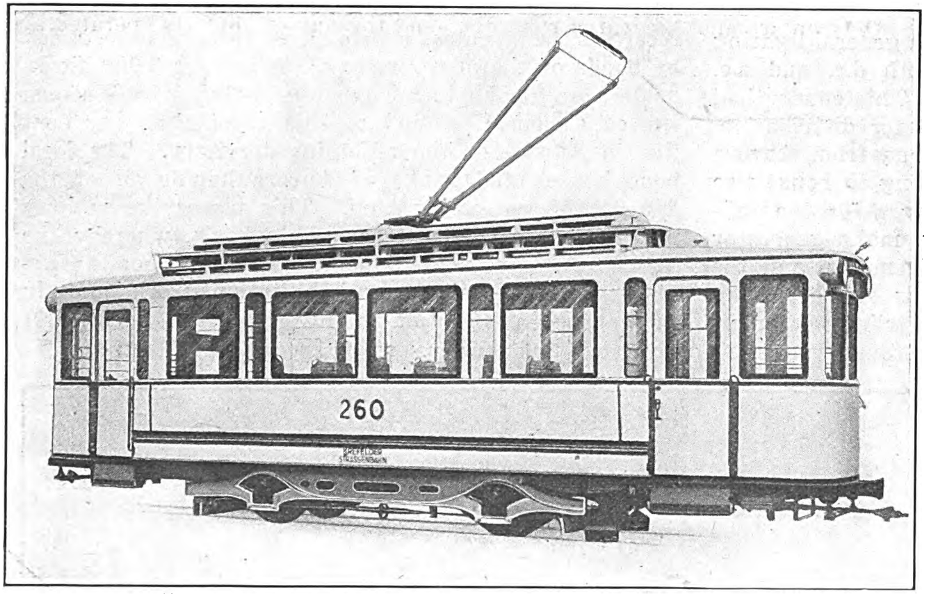
# New German Cars Have Unique Features

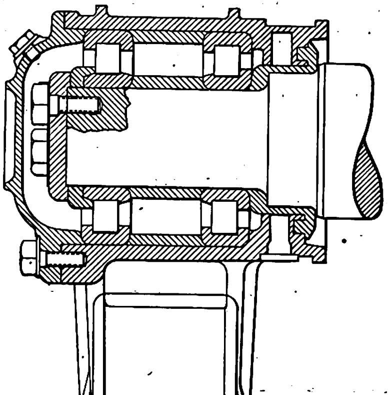
### Thin Castings for Truck Side Frames—Special Leaf Springs Used—All Bearings Are Roller Type—Air for Motors Taken In at Roof—Doors on Ball Bearings

SOME interesting details of the construction of thirty new cars added to the rolling stock of the Krefeld Street Railway system (Germany) is given in *Verkehrstechnik* for Sept. 7, 1923. This is a meter gage electric railway and the cars are 34 ft. 4½ in. long, 7 ft. 1⅞ in. wide and 10 ft. 8¾ in. high. Seats are provided for twenty-two passengers, with additional room for twenty-five standing passengers. Single trucks are used which have a wheelbase of 9 ft. 9 in.

The construction of the trucks is of particular interest, as the side plates are cast of extremely thin electro-furnace steel. These plates have a strength of from 600 to 700 lb. per square inch and an elongation of 20 per cent. After the frames were cast they were annealed for several days. All supporting bosses for the brake rigging, motor suspensions and cross beams are cast in one piece with the main plates. The brake shoe heads are rigidly connected by a cross bar. This eliminates side motion and provides a uniform setting so as to utilize the full surface of the brake shoes. The diameter of the wheels is 35.1 in.

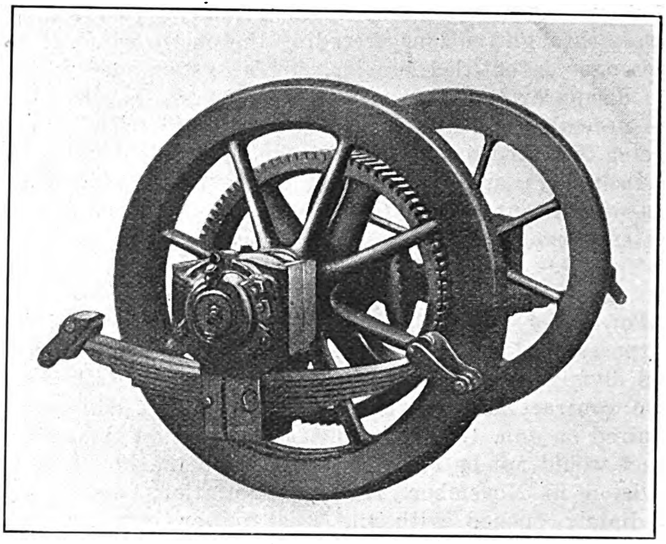
The spring suspensions for the body and the truck are also of particular interest. Leaf springs are used under the center of each axle. These are held in place by a single wide block. The springs are 31.2 in. long and 3.9 in. wide. They are composed of eight individual leaves, having a cross-section of 3.9 in. x 0.39 in. Additional leaf springs are provided for supporting the car body. These are 46.8 in. long and 9-ply. The cross-section is the same as the truck axle springs. Exceptionally thin spring leaves have been chosen after an extended investigation and are giving very good results.





At Left, New Type Car Used in Germany. The Line Drawing Shows Type of Spring Suspension Provided Between Truck Frames and Axles

All bearings are of S.K.F. precision roller type with no side play. A special arrangement of the cage rings prevents edging of the individual rollers. The outer guide rings of the rollers are held in place with a cap over the end of the shaft, and this is fastened to the shaft by three small screws. Rollers can be removed by taking off this cap, leaving the inner smooth guide ring on the shaft, thus assuring proper reassembling. Provision is made for packing the bearing with a special paste so as to make it watertight. The inner side of the bearing is equipped with a stuffing box and all bearings have sufficiently large internal pockets to hold enough lubricant for several days operation.



Roller Bearing Construction Used for Journals

These cars are intended for operation with a trailer and a draw bar is provided which will pull the truck and car body at the same time. The coupler has a hinged crosshead with an adjustable conical bolt to avoid excessive motion.

The car body construction consists of oak upon a steel skeleton. Pressed steel is used for the main and cross girders. The platforms are completely inclosed and all doors are single and 25.35 in. wide. The doors are mounted on ball bearings with adjustable ball races. A special lock permits opening of the doors from both sides. By closing two side panel doors against a permanent narrow center panel, an inclosed compartment is provided for the motorman.

The motors are A.E.G. with commutating poles and self-ventilation. The armatures have S.K.F. roller bearings and a very small air gap. Air for cooling the motors comes from the roof of the car through a duct.

This duct has a filter to keep out grit or dust, and a tin cap covers the intake to prevent rain from entering.

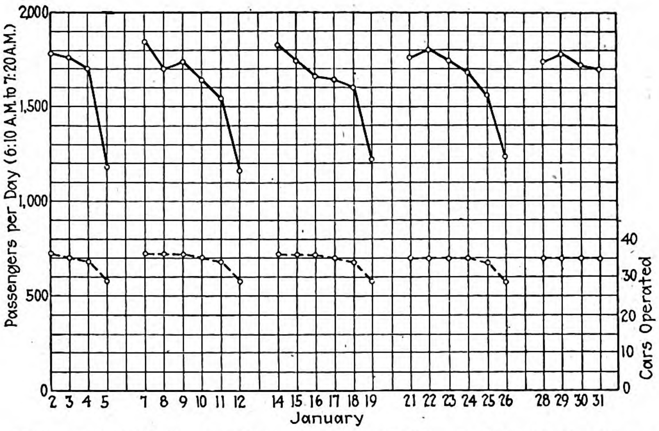
The current collector is of the bow type with a carbon contact edge. The trolley pole can be raised or lowered from within the platforms. The starting resistors are mounted on the roof. Illumination of the car is from lamps arranged in three circuits, each with four lamps in series. All circuits contain automatic ballast resistors, consisting of iron wires in hydrogen gas, such as are commonly used in Europe. This causes the lamps to burn uniformly on voltages varying between 550 and 750.

# Variable Mill Riding Requires Careful Checking

### Early Morning Peak Serves as a Barometer for the Regulation of Schedules in New Bedford—Modern Light-Weight Cars Have Been Purchased to Assist in Handling This Traffic

THE principal industry of New Bedford, Mass., is the manufacture of cotton cloth and yarn, and traffic on the Union Street Railways varies directly according to the prosperity or depression of this industry. Riding in the morning prior to 7:30 o'clock is confined almost entirely to mill employees and constitutes the morning peak on the railway. It is subject to peculiar fluctuations and in some respects serves as a barometer of what the traffic will be throughout the day. An increase in the morning mill riding usually indicates that there will be an increase in all other riding during the day. For this reason the railway makes a very careful check of the morning rush hour daily and regulates its schedules for the remainder of the day from that.

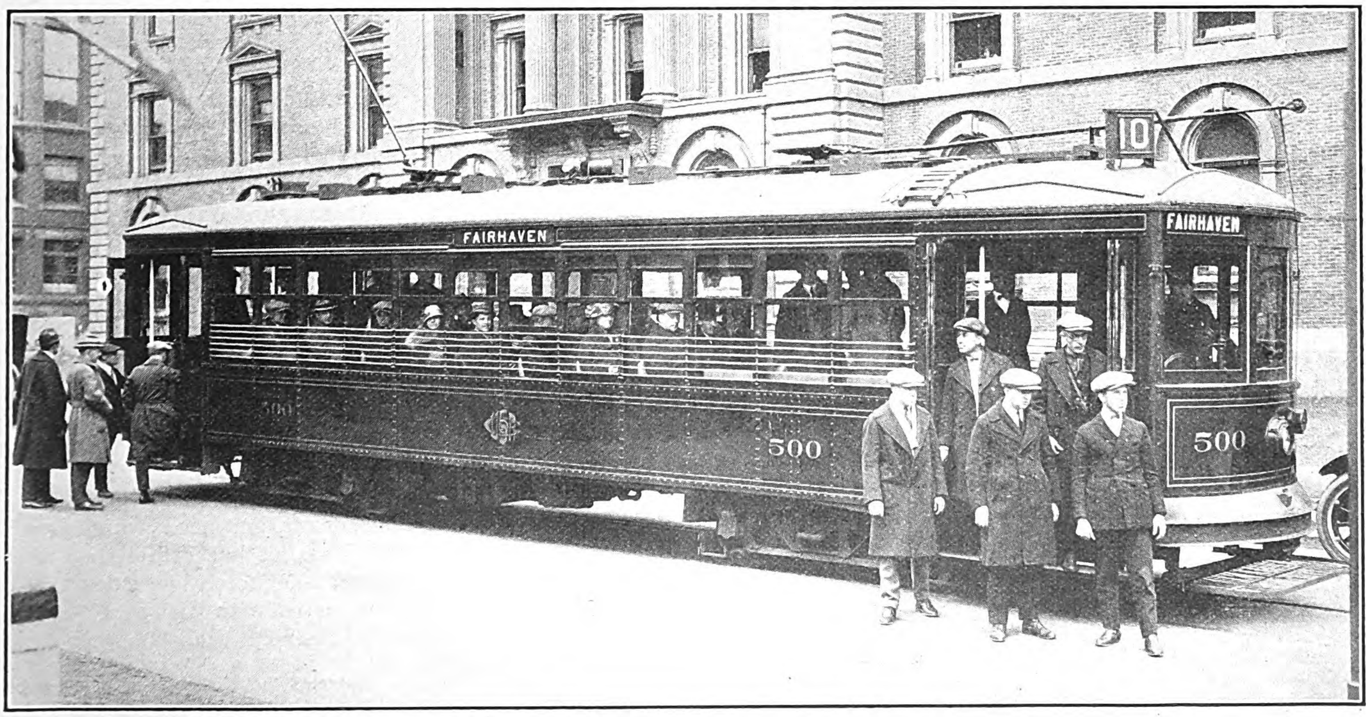
Geographically the city of New Bedford is divided into three distinct districts, the north, center and south. Each district is covered by a uniformed railway inspector during the hours that the cars are operated, who from 6 a.m. to 7:30 a.m. week days is stationed at the point of heaviest loading in his territory. He records on a checking card the scheduled and actual time of arrival of every car and the number of passengers carried. These cards are turned in to the office of the superintendent of transportation before 8:30 o'clock the same morning.



**Manner in Which the Morning Peak Riding Is Plotted for Comparison with Other Days in Order to Adjust Service for the Balance of the Day**

It was formerly the practice of the Union Street Railway to check its traffic by totaling the conductor's reports of register readings on the cars. Experience showed, however, that this was a misleading figure, because the difference between the maximum load on the car at any one time and the total number of passengers carried on a trip was variable. For this reason the method was adopted of checking by actual count at the point of heaviest load.

Each morning after the inspector's checks are received in the office, the figures are copied on a large traffic sheet made especially for the purpose, and plotted. The total number of passengers carried during the morning rush hour and the number of cars operated are plotted separately for each district. Riding for that particular morning is then compared with other mornings of the same week and with riding for the cor-



**This Type of Modern Light-Weight Car Has Speeded Up the Service in New Bedford**

responding day of previous weeks. This comparison provides an accurate forecast of what the railway's passenger traffic will be for the entire day. The method of plotting these figures is shown in an accompanying illustration. From this chart for one particular division it will be noted that the riding varies considerably from day to day, being consistently less in the latter part of each week, with a very decided drop on Saturday morning. Part time working of the mills is the explanation of this phenomenon. Each district has characteristics of its own, however, one being quite even throughout the week and another declining very sharply as in the case illustrated.

This system of checking makes it possible to regulate the service for the remainder of the day according to the riding during the morning rush. The time-tables are so arranged that many of the tripper runs can be allowed to remain in the carhouse without disorganizing the schedules. As soon as the inspectors' morning checks have been received by the transportation officials, it is decided what trippers will be operated that evening. A list of the tripper runs to go out in the afternoon is then posted on the bulletin board. However, as only about one-half of the evening rush-hour traffic is composed of mill employees, it is necessary to consider also some other factors when deciding how many trippers shall be run.

Modern light-weight two-man cars suitable for handling the rush-hour traffic in New Bedford have recently been purchased by the railway. A saving in weight of 6 tons per car has been accomplished, the new type weighing only 30,000 lb. They are equipped with four Westinghouse No. 508 motors per car, giving a total horsepower of 100 as compared with 160 hp. for the older cars. The wheel diameter has been reduced from 33 in. to 27 in. No change has been made in the seating capacity, and the new cars are the same length as the older type. The lower steps and wider doors, as well as the absence of the end bulkheads, make for more rapid loading and unloading. These cars have proved particularly well adapted to the service for which they were bought. At the same time their attractive apearance, resulting from pleasing lines and careful painting, created a favorable impression on the general public.

## Hose Jumpers Sent to Every Fire

THE track layout in the city of Providence, R. I., is such that emergency rerouting in case of fire in the downtown business district is somewhat difficult. In order to prevent tieups of the street railway system, as far as possible, the company has established the practice of sending hose jumpers to every fire occurring along streets used by the cars. The jumpers are carried on a small railway car kept in a central location expressly for this purpose.

The city fire alarm system has been connected up with the office of the superintendent of transportation, and every alarm rings there as well as at fire headquarters. On a near-by wall is posted a list of the boxes and immediately upon the sounding of an alarm examination is made to see if the fire is located along the railway tracks. If it is, word is at once sent to the emergency car, which proceeds with the hose jumpers to the location of the alarm. These devices thus come in for frequent use and they have saved the railway many serious delays.

# Public Relations in San Diego*

### Railway Company Has Developed a Number of Ways to Cultivate Good Public Relations—Rendering of Special Service Is a Feature

THE San Diego Electric Railway has developed some rather unusual ways for improving the good public relations which have always existed in the city of San Diego. The company has made an effort, at various carnivals and affairs held during the year under auspices of county and city organizations, to erect education booths, where by means of maps, charts and diagrams a story of the company and its relationship to the citizens has been shown graphically. Some representative of the executive department, or sometimes a platform man, has occupied at these booths to answer questions and to deliver impromptu explanatory talks upon such subjects as visitors might indicate by their queries. The relationship established through these contacts has been continued by encouraging the participation of the employees of the company in civic affairs and in various fraternal and social organizations. Particularly has membership in district improvement clubs and in church and social groups been encouraged.

At the end of one of the company's lines it has maintained at its own expense one of the most beautiful flower gardens in southern California. This is at Mission Cliff Gardens, as the reservation is called. It is the site of most of the reunions and state picnics which are a part of California life, and is kept attractive at all times by an ample force of gardeners and caretakers. No admission is charged. The company's interest in similar undertakings conducted under public or semi-public auspices is shown by its support of a zoological society, organized during the past year. Free service has also frequently been given for outings and picnics by orphanages. A girls' club, made up of young women employees of the company, has been encouraged by the company to contribute its social hours, money and material to the various welfare organizations of the city.

Not the least of the accomplishments in this direction has been the co-operation which the company has given to the local office of the United States Veterans' Bureau, rehabilitating men disabled in the war. A number of these veterans are in what is known as "Placement Training," that is, they are learning with the company under government supervision the trades and occupations which will fit them again to be self-supporting. If possible the company employs the graduates.

The company carries on its payroll a man who is stationed every day in the Plaza, a park in the heart of the city, which is a favorite starting point for tourists, and it is his business to answer all questions and give all directions requested pertaining to local points of interest. This information clerk has answered as many as 7,000 questions in a single day, and on an average Sunday morning he directs some 250 to 300 persons to churches.

Finally, the company has made a special effort to serve any particular transportation need which may exist in the community. Thus, it has established bus feeder lines to districts not adequately served by the trolley line, and it has contracted with the school board to give a special service to the high school.

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*This article is based on material included in the brief submitted to the Charles A. Coffin Prize Committee of the American Electric Railway Association by the company named.

# Toronto's Two and a Half Years of M. O.

### Operating Success to Date May Be Attributed Largely to the Integrity and Progressiveness of the Management, Rather than to Municipal Ownership —The Property Has Been Completely Rehabilitated and the Principal Lines Rerouted—Many Other Improvements Made

By *"Observer"*

ENOUGH time has elapsed since the city took over the lines of the Toronto Railway Company on Sept. 1, 1921, that some idea can be obtained of the progress made under municipal operation. Unlike some other municipal properties, every effort has been made to give real service and provide the city with a good and modern transportation system.

Canada is more given to municipal ownership than the United States. Several of the smaller electric railway properties are owned by the municipalities. Then, too, one cannot overlook the great "Hydro" system which supplies the greater part of Ontario with electrical energy from Niagara at reasonable rates. The way this project has taken with the public is noticeable in the housefurnishing stores, where electric ranges are on display. They are advertised in the newspapers as commonly as gas ranges are on this part of the continent. The Canadian National Railways is another example of government ownership on a scale far larger than anything attempted in the United States.

Toronto is the largest city in the Province of Ontario, and is running a close second for the greatest population in all Canada, with about 550,000 inhabitants. Its growth has been quite rapid, and unless some unforeseen condition halts its progress, it will not be surprising if it passes Montreal within the next few years. While there is considerable manufacturing, the city is more of a commercial center, the distribution of merchandise being a leading activity. This is inevitable, as the city is situated on the northern shore of Lake Ontario, with a fine natural harbor formed by an island directly off shore. Rail transportation is furnished by the Canadian National Railways and the Canadian Pacific, the two great railway systems of the Dominion.

Since the railways are located along the waterfront, the business section of the city naturally began its development close to the harbor. Yonge Street, the principal thoroughfare, runs back directly northward and at right angles to the lake front. Its intersection with King Street, a few blocks away, was formerly the business center, but in recent years there has been a trend uptown, so that now the retail district is closer to Queen Street, which is four blocks further back. Thus the stores are concentrated in a relatively small area, a condition that tends toward serious congestion similar to that in the average city of the United States.

For a long time previous to municipal operation the street railway system was on the down grade. The tracks and the cars were badly in need of repair, and the facilities for housing the cars and for doing the repair work became more inadequate as time went on. This condition was in part due to the determination of the city to obtain control of the property and to operate it as a municipal enterprise, which kept the owners from investing new capital. The story of the proceedings has been recounted in detail in this paper. It culminated in the purchase of the property by the city in 1921, the price being settled by a board of arbitration after a long drawn out series of hearings.

One factor that has contributed in no small degree to the success of the enterprise is the non-political character of its control. This has been divorced entirely from the local political fields, being in the hands of a non-partisan commission of three men chosen on the basis of their business ability. In their turn, they have adopted the same method in the selection of the active management. H. H. Couzens, who has been general manager from the beginning of municipal operation in Toronto, had already made an enviable record as an executive when he took charge of the system. That his administration was successful is attested to by his recent selection for the vice-presidency of the subsidiary companies of the Brazilian Traction, Light & Power Company, a private enterprise. The esteem in which Mr. Couzens is held locally is attested to by the commendatory editorial comment in all the Toronto papers on the announcement of his new connection, no matter what their political complexion.

The same policy of non-partisan control has been continued with the promotion of D. W. Harvey, who has made an excellent record as assistant manager under Mr. Couzens, and who will succeed him.

#### REHABILITATION OF THE PROPERTY WAS A REAL PROBLEM

A big problem of rehabilitation faced these men when they took control of the property. In addition to the Toronto Railway, there were several so-called civic lines that had been built by the city to serve outlying districts in which the old company had failed to make extensions. These had to be tied in and coordinated with the rest of the system. This situation required an extensive program of track reconstruction, in which all but about 50 miles was rebuilt. Then the portions of the radial lines located within the city limits were added, so that today the commission operates all the street railway track in the city.

The condition of the property when it was taken over ranged from 55 to 90 per cent, according to the engineers who testified at the arbitration hearings, an average figure being about 74 per cent. This indicates a standard much lower than that found on the average American property in fair operating condition, which will run about 85 per cent.

Quantity production methods had to be worked out for the construction of the track, but the proposition was handled so well that all of the work was done during the past two seasons and this year's construction program will be quite small, the track all being in good condition. The construction methods used were described in this paper, issue of April 1, 1922.

The rolling stock was all of it old, the greater portion being of the types familiar a generation ago. Trailer trains of single-truck cars were familiar sights in the rush hours right up to the time the city took hold. Within two years rolling stock was purchased to meet all the requirements, except for a few of the lighter lines where it was felt that the older cars could be remodeled to advantage. This work has now been done, so that all of the cars in service are either new or have been thoroughly overhauled within the past two years. On all the heavy lines trains of pay-as-you-pass motor cars and center entrance trailers are in use. Improvements of many kinds have been incorporated in these cars, the three-door design of the trailer being unique. These cars were described in detail in ELECTRIC RAILWAY JOURNAL for June 23, 1923.

The best of the old cars have been overhauled and are in service on lines where the duty is not so severe. Thirteen of them have been re-equipped for one-man operation.

The carhouses were inadequate to care for the old rolling stock, and entirely unsuitable for the new large cars. This necessitated the construction of a series of carhouses and storage yards of modern design.

Proper facilities for overhauling cars were almost entirely lacking when the commission began its work. A new shop, with a capacity for handling fully twice the number of cars in active service, has been placed in service within the past month. This has all the latest facilities for rapid handling of equipment and economical operations. A complete description will be published in an early issue of this paper.

That the commission has had the funds with which to make these radical improvements is due largely to the foresight displayed at the outset in fixing a rate of fare that was sufficient to provide enough revenue to leave a surplus after paying normal operating expenses. The fare had been 5 cents for years. Even before the beginning of city operation, the announcement was made that the fare under the new control would be 7 cents cash, or four tickets for 25 cents. Children's fares were raised proportionately.

The increase in fares caused considerable adverse criticism from those who had expected some form of magic from municipal operation, but they have long since forgotten their displeasure in view of the improved service rendered.

Another move made at the beginning was the cancellation of licenses of all competing buses. These had given the old company some trouble, and had caused a loss of revenue. This did not have to be faced by the commission, making it somewhat easier to handle the situation.

The result of these arrangements and improvements has been that the system is now able to give real service to the city. The increase in rate of fare did not affect all the riders, as the civic lines, which were taken over by the commission, formerly had collected an additional fare of 2 cents above that charged by the company. Through service was given on these lines, thus making them an integral part of the system.

It soon was found that the routes as formerly laid out did not serve the city at all well. There was too much duplication of service, and the congestion in the heart of the city was bad. A few minor changes were made as quickly as possible, but in July, 1923, the principal routes were changed quite radically. There was a material saving effected by the rerouting, but the major part of it was put back into service. The service given in the non-rush seems to be more than adequate, while in the rush hours the capacity furnished is apparently ample to handle the loads without undue crowding. If anything, the service could stand a reduction. Then, too, there is practically no short-routing of cars except on a few lines in the rush hours. Many cars go through to the outer terminals with light loads, and the routes are so long that there is no chance for cars to make second trips in the rush.

### BUSES AND TROLLEY BUSES ARE ALSO USED

Advantage has been taken of all available means of transportation. Both gas buses and trolley buses are in use on certain of the outlying lines, where it has not been felt that rail service would be justified at present. These vehicles are being operated strictly as adjuncts to the trolley cars, and it is stated that the rails will be extended in each case if the business warrants. The buses used are of the most modern types, and they are maintained on the same standards as have been adopted for the cars.

The organization is much the same as that of a private company. There is no difference in the attitude of the department heads toward their work. They appear as anxious to keep down expenditures and obtain maximum results as men in similar positions anywhere. In fact, they seem to take pride in the fact that they can do things better than their competitors. All positions are under the control of the general manager, which in itself indicates the desire to keep political appointees out of office.

The platform men seem well trained and courteous. They appear to be working for the interests of their employers as much as in any private corporation. They are unionized, but up to the present time there has been no conflict with the management. They have requested vacations with pay similar to those of monthly employees, but have accepted the statement that such concessions cannot be granted to men working by the hour and being paid for overtime.

A good point noticed was the method of determining what children should pay full fare. In each car a mark is made on a stanchion or some other vertical part 51 in. from the floor. If the child is under this height he pays half fare, if above, full fare. This eliminates disputes and makes it unnecessary for parents or children to resort to perjury.

A factor which is the source of serious concern to the management is the competition of private automobiles. The past winter was very mild until February, and many people kept their machines in service, with the result that the receipts were slightly lower than for the previous year. In February, however, the weather was quite bad and there was a heavy fall of snow, with the result that the automobiles remained in their garages and the people rode the cars, producing an increase in business over last year. Even though it is a municipal enterprise, it must face adverse conditions, just as the private company.

Altogether, the public seems well pleased with the venture in municipal ownership. Of course there is the contrast with what had gone before, so that the service has been a distinct improvement. It ranks as good service, however, when measured by the standard of any American city, and is far better than some of the private operations one might mention.

# Unified Traffic Control Tried in Los Angeles

### Movement of Motor Vehicles in the Congested Area Has Been Facilitated, but Railway Operation Has Been Slowed Down Considerably

THE Los Angeles Railway has found the unified traffic control system installed three years ago a handicap to its operation. Comments on this subject were made by G. B. Anderson, manager of transportation Los Angeles Railway, at the Midyear Meeting of the American Electric Railway Association at St. Louis March 4, as noted on page 372 of the ELECTRIC RAILWAY JOURNAL for March 8, 1924. In the opinion of the railway there is no automatic signal that can handle traffic as expeditiously as a manually operated signal when the latter is in charge of a competent man.

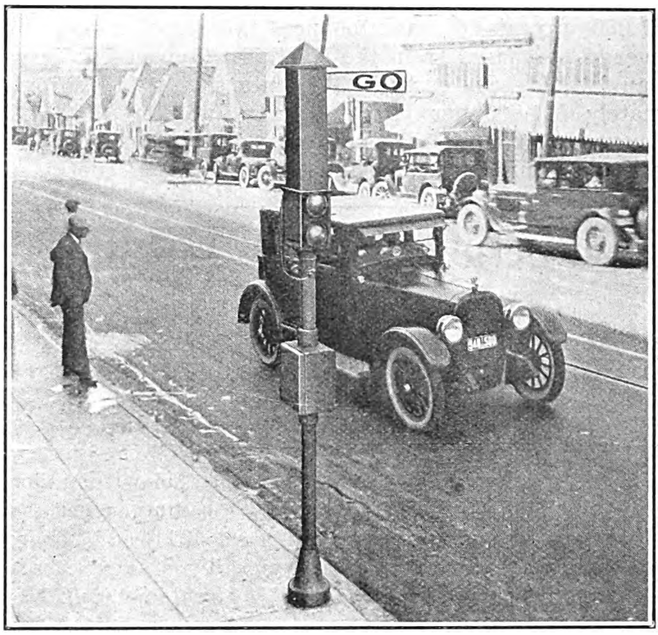
Prior to 1921 the handling of traffic in Los Angeles was accomplished by stationing a patrolman at each important street intersection. Increasing congestion eventually demonstrated the inadequacy of this system and indicated a need for some sort of control that would permit faster traffic movement. During that year a new system was installed, consisting of signals at the busiest intersections in the city, all controlled from a single central station.

The timing station is located in the approximate center of the congested area of the city. From there five main circuits connect with signals at 31 intersections. At each corner there are four signal standards, equipped with "go" and "stop" arms, as shown in the accompanying illustration. Under the normal method of operation traffic proceeds when the "go" arms are displayed at diagonally opposite corners. The "stop" arms at these corners are then folded out of sight. Simultaneously the "stop" arms are displayed at the other two corners, while the "go" arms there are folded up. In case it is necessary to change the method of operation at any particular intersection the four signals may be operated manually from one of them, which is known as the master control unit for that corner.

Below the semaphore arms there are red and green lights. The former operates in conjunction with the "stop" arm and the latter with the "go" arm. During the daytime the lights are switched off. At the top of the signal standard under the hood is located an electric bell which rings for three seconds with every movement of the semaphore arms. The bell, however, is operated from the central station independently of the arms and can be used also to give special signals as in case of an alarm of fire.

When the system is operating automatically the direction of traffic flow is alternated at consecutive intersections, the theory being that this alternation makes possible a continuous movement over several blocks in a single direction, the signals changing to "go" just as the moving vehicles reach the corner. This is thought by the advocates of the system to be a better arrangement than to have the intersections controlled by traffic officers who may not co-ordinate their signals, thus allowing more traffic to flow into some blocks than is allowed to flow out again at the next intersection. It is said to be superior also to a traffic control system whereby all traffic is simultaneously halted over a large area to permit the movement of cross-traffic. The claim has been made that it is possible for an automobile to pass from one end of the congested district in Los Angeles through to the other end without being once delayed by cross-traffic. Careful observation, however, does not confirm this contention.

One of the difficulties with the present arrangement is that the north and south interval of 45 sec. is too long in comparison to the east and west interval of 35 sec. Observation has shown that there is often from 8 to 20 sec. when the signals are clear for north and south movement and no traffic to move. Meanwhile east and west bound traffic is held up. Traffic officers make little attempt to stop the flow of traffic over the intersections until the change of signals. As a consequence signals are found reading "go" in one direction while the traffic is still moving on an intersecting street.



A Signal Standard of This Type Is Used at Each of the Four Corners of Every Street Intersection in the Congested District of Los Angeles

The railway has found that there is a temptation for motormen to try to beat the traffic signal and start their cars too soon. When the signal is clear there is a natural desire to take advantage of it and the cars sometimes fail to wait until all passengers have boarded. Also, drivers of motor vehicles often operate at excessive speed in their desire to beat the signal at a crossing. It is thought that a majority of the automobile accidents in the congested districts are attributable to this cause.

# Purchasing Energy Saves $15,000 a Year

ARRANGEMENTS have recently been completed by the Hartford & Springfield Street Railway, Warehouse Point, Conn., for the purchase of electrical energy from the Northern Connecticut Light & Power Company, Thompsonville, Conn. The railway's steam power plant at Warehouse Point has been shut down and direct current for car operation is obtained through a 1,000-kw. rotary converter substation.

The railway company has been in the hands of a receiver for some time, so that the agreement made with the approval of the court is for one year only and thereafter from year to year until terminated by either party. The introduction of central station energy into this situation indicates a substantial saving to the transportation company, the rate for energy being on a sliding scale to compensate for variation in power demands.

Two 500-kw. rotary converters with the necessary transformer equipment have been installed by the railway to supply the trolley service, energy being purchased at 13,200 volts. The converter and transformer installation cost about $25,000. The railway company generated 2,392,000 kw.-hr. in 1922 at a total cost of $69,950 (the principal items were fuel, $46,210, and power station labor, $14,262). Allowing 15 per cent loss in the conversion would require the purchase of 2,673,410 kw.-hr. At the contract price, including 15 per cent charges on a total investment of $30,000 on the part of the railway to provide for the supply and $1,000 a year for maintenance, the same amount of energy purchased from the Northern Connecticut Company would have cost $54,948, or a saving of approximately $15,000 per year to the railway on the 1922 consumption basis—50 per cent on the cost of the equipment installed to permit the purchase of energy.

# Daily Statement of Earnings and Expenses

### Eastern Massachusetts Street Railway Finds It Useful in Making Service Adjustments—Also Keeps Census of Industrial Population

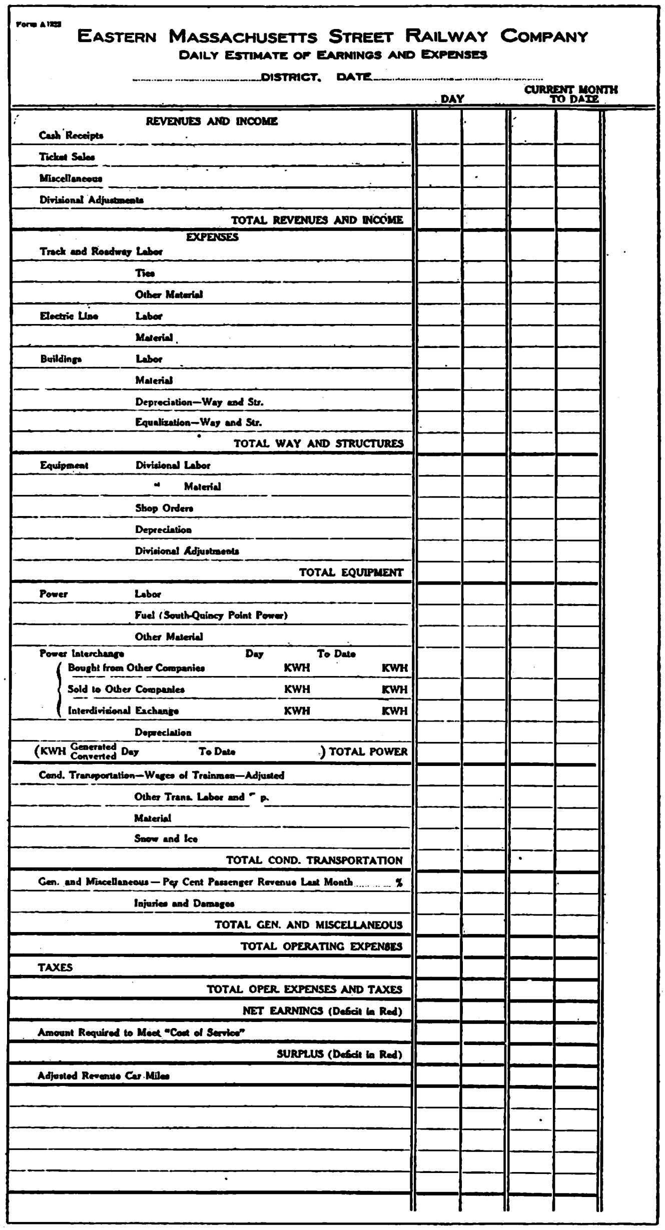
FOR about four years the Eastern Massachusetts Street Railway has followed the practice of requiring each of its fifteen local managers to compile a daily statement of earnings and expenses. The advantages of such a statement over the monthly statement are apparent, especially as the monthly statement usually is not available earlier than the 10th of the month following that for which it is compiled. With the daily statement, tendencies in both earnings and expenses can be very quickly detected, and the plan makes possible very prompt action in controlling service and other expenses.

Possibly closer attention to changes in the demand for transportation is necessary in very highly developed industrial territory, such as that served by the Eastern Massachusetts Street Railway, than in a community with more diversified interests. Slight changes in the cost of raw materials or in the demand for finished products affect directly the number of employees required in the many large cotton mills, woolen mills and shoe factories in the territory of the Eastern Massachusetts Street Railway.

The form upon which this daily statement is compiled is reproduced herewith. The reports from each division are assembled by one of the assistants in the central office. He keeps in close touch with all work being done and with the records as they come in from the divisions and thus can watch the margin between receipts and expenses as well as quickly detect any abnormal or unwarranted tendencies in either gross or net. Any such tendency is investigated and called to the attention of the proper officials. Summaries of the major items are prepared every seven days.

This plan makes available for the management reasonably accurate figures on the second day after the day to which they apply. While some estimates necessarily have to be made, it has been found that the figures are so accurate that the totals at the end of the month will not vary to any important extent from the corresponding actual figures in the regular monthly report. In practice, a few of the daily expense figures are the daily average of the monthly figure, so that it is necessary to calculate only the variable items.

While this daily statement has proved most useful for the purpose intended, it is not the only means used for determining promptly possible variations in the demand for transportation. Another and very effective way is by keeping an up-to-date "census" of the employees in the principal factories served. The basis for this census is a count which was taken three or four years ago, showing for each district the distribution of industrial workers and their demands for transportation. Since then, the railway company has arranged with each large employer of labor in the district to appoint some one in his organization to inform the railway promptly of any changes in the factory force which will affect transportation schedules. The interest of the employer lies in the fact that his employees in this way are insured of adequate car service when the working forces are increased.



Form A1[illegible]

EASTERN MASSACHUSETTS STREET RAILWAY COMPANY

DAILY ESTIMATE OF EARNINGS AND EXPENSES

..........................DISTRICT, DATE..........................

| | | DAY | CURRENT MONTH TO DATE |
|---|---|---|---|
| REVENUES AND INCOME | | | |
| Cash Receipts | | | |
| Ticket Sales | | | |
| Miscellaneous | | | |
| Divisional Adjustments | | | |
| | TOTAL REVENUES AND INCOME | | |
| EXPENSES | | | |
| Track and Roadway Labor | | | |
| | Ties | | |
| | Other Material | | |
| Electric Line | Labor | | |
| | Material | | |
| Buildings | Labor | | |
| | Material | | |
| | Depreciation—Way and Str. | | |
| | Equalization—Way and Str. | | |
| | TOTAL WAY AND STRUCTURES | | |
| Equipment | Divisional Labor | | |
| | " Material | | |
| | Shop Orders | | |
| | Depreciation | | |
| | Divisional Adjustments | | |
| | TOTAL EQUIPMENT | | |
| Power | Labor | | |
| | Fuel (South-Quincy Point Power) | | |
| | Other Material | | |
| Power Interchange | Day / To Date | | |
| Bought from Other Companies | KWH / KWH | | |
| Sold to Other Companies | KWH / KWH | | |
| Interdivisional Exchange | KWH / KWH | | |
| | Depreciation | | |
| (KWH Generated Converted Day To Date ) | TOTAL POWER | | |
| Cond. Transportation—Wages of Trainmen—Adjusted | | | |
| | Other Trans. Labor and " p. | | |
| | Material | | |
| | Snow and Ice | | |
| | TOTAL COND. TRANSPORTATION | | |
| Gen. and Miscellaneous—Per Cent Passenger Revenue Last Month .......% | | | |
| | Injuries and Damages | | |
| | TOTAL GEN. AND MISCELLANEOUS | | |
| | TOTAL OPERATING EXPENSES | | |
| TAXES | | | |
| | TOTAL OPER. EXPENSES AND TAXES | | |
| | NET EARNINGS (Deficit in Red) | | |
| Amount Required to Meet "Cost of Service" | | | |
| | SURPLUS (Deficit in Red) | | |
| Adjusted Revenue Car Miles | | | |
| | | | |
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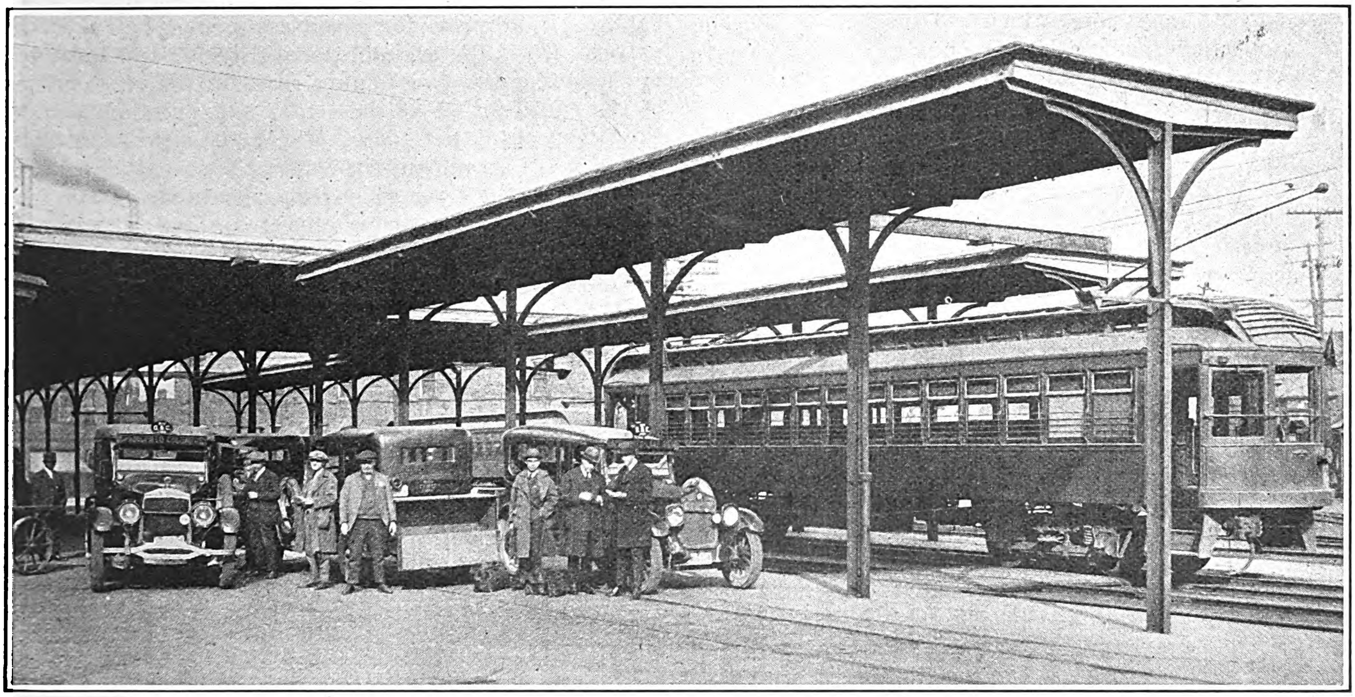
Form Used for Daily Statement on Earnings and Expenses, Eastern Massachusetts Street Railway

# Railway Operates Passenger Automobiles for Intercity Service

### Indiana, Columbus & Eastern Traction Company Uses Seven-Passenger Touring Cars Under Competitive Conditions—Cost of Operation Is Comparatively Low—Rules Insure Careful Operation—Regular Maintenance Reduces Road Failures



Buses and Cars, Both Operated by the Railway, Use the Same Terminal

BUS service in competition with their own interurban lines as well as with other buses has been operated for the past year by the Indiana, Columbus & Eastern Traction Company, Springfield, Ohio, and the Columbus, Newark & Zanesville Electric Railway. Twenty-six Studebaker seven-passenger touring cars are operated on an hourly schedule between Columbus and Dayton and between Columbus and Zanesville. Bus schedules are arranged so that they are staggered with the interurban cars to give the equivalent of half-hour service.

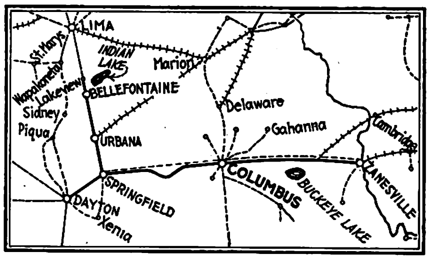
In order to gain the advantages accruing to those who were bona-fide bus operators when the revised Ohio motor bus law went into effect, these railways were forced to put an extended bus system into operation hurriedly. They entered the bus business to control the routes paralleling their interurban lines and also because they believed that there was a real public demand for this type of transportation and that it should be furnished by the existing companies. The entire plan was inaugurated between April 8 and April 12, 1923. Considerable publicity has been given the new operation to assure the traveling public that the bus service will be continued by the electric railway after competition has been eliminated.

In studying the effect of private automobiles on interurban earnings, the management found that more serious inroads were made on local business than on through business. The conclusion was reached that the passenger automobile had also created a certain demand for motor transportation that really represented new business. It was believed that a certain proportion of intercity riding in private passenger cars could be induced to utilize a properly operated bus system. This would thus represent new traffic that could not be induced to use the interurban railway line. Providing competition was eliminated, such business could be handled profitably by bus. Moreover, it was felt that the use of comparatively light, cheap passenger cars would give low investment and low operating costs and would reduce the losses incurred during the period of competition.

The bus routes parallel practically all the divisions of the electric railways with the exception of sections between Dayton and Union City, Lakeview and Lima and Newark and Zanesville. Twenty-one vehicles are required to operate the hourly schedules, although twenty-six were purchased to provide a sufficient number of extras. They are seven-passenger Studebaker "Big Six" touring models, equipped with winter tops.

At first, to determine the possibilities of the new service, the buses were operated from 4 a.m. to 11 p.m. The fare is on the basis of 3 cents a mile and with a vehicle seating seven paid passengers the maximum possible revenue would be 21 cents per bus-mile. Under the competitive conditions existing, however, only 8 cents per bus-mile was actually obtained.

A schedule speed of about 30 m.p.h. is maintained.



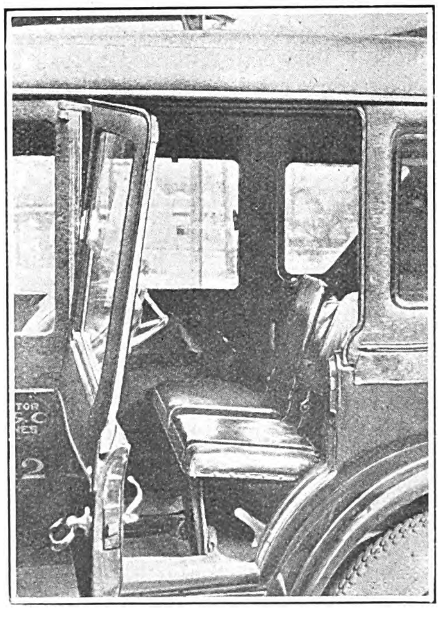
Railway Bus Routes Between Dayton and Zanesville Parallel Company's Tracks

Drivers get 45 cents an hour and are paid for ten hours of operation. A careful check has shown that from seven-tenths to eight-tenths of this time is actual operating time. Hence, platform wages are in the neighborhood of 2 cents per bus-mile. It was soon found that the total operating costs were approximately 9 cents per bus-mile. This is based on a three-year life, or an estimated mileage of 150,000 miles. In the 9 cents, however, only that portion of the railway overhead representated by actual expenses incurred incident to the bus operation is charged against the buses.

This schedule showed a loss due primarily to the small load factor incident to the long hours of operation. When the service was changed to a so-called daylight schedule, namely, from 7 a.m. to 6 p.m., corresponding with the hours operated by competitive lines, the revenue was increased from 8 cents to 11½ cents per bus-mile, with practically the same operating costs per mile. The change in schedule gave a slightly increased fixed charge per mile, but also resulted in a reduction of 30 per cent in the number of miles operated per day and a consequent reduction in the depreciation rate.

The estimated life of 150,000 miles per vehicle is based on experience with motor cars which have already been in service for more than 100,000 miles. It is estimated that this mileage will allow cars to be scrapped before any serious increase in maintenance cost or service delays is experienced. Rigid inspection and prompt renewal or replacement of defective or questionable parts are practiced and are considered very important in connection with obtaining reliable service for this mileage from each vehicle. Tires, which are the most frequent cause of road failures and delays, are inspected and examined at frequent intervals and removed as soon as any question arises as to their condition.

The maintenance charges, over a six-month period, including vehicles which had made more than 90,000 miles, was 3¼ cents per mile. For the month of May, 1923, with entirely new equipment, the cost was 3.69 cents per mile, whereas during the month of September, after six months of service, the cost was 2.93 cents per mile.



An Additional Seat Is Made by Bridging the Space Between the Two Regular Seats

A mechanical organization for the maintenance of the bus equipment has been built up entirely separate from the regular railway maintenance forces, with the exception that the garage foreman reports to the railway master mechanic. A separate building is equipped for the maintenance, storage and servicing of the buses and mechanics trained in automobile maintenance are employed for this work.

The buses are operated by subsidiary organizations known as the Dayton & Columbus Transportation Company and the Columbus & Zanesville Transportation Company. Tickets are sold by agents in the interurban stations in the various towns through which the buses operate. Seats are reserved in advance when tickets are purchased. The station agent is provided with a diagram which is turned over to the driver at the time of the departure of the bus, showing the seat number, ticket number and destination of each ticket sold for that vehicle. The passenger's ticket also specifies the seat in the bus to which he is entitled. A diagram similar to a Pullman diagram is filled out, giving each passenger's destination. It provides for seven seats in addition to the driver. Room for one additional passenger is arranged by fastening the two folding seats in the rear section of the car together at the center and building a short extension on either side. The construction is illustrated in an accompanying illustration.

A bus driver's report envelope contains on its face full information covering the trip, and a separate envelope is used for each trip made. These reports are turned in to the cashier and contain all canceled tickets, cash fare receipts, stubs and the seat diagram for the trip. Cash collected en route is handled in another special envelope provided for this purpose. A bus driver's wheel report is used to inform the garage of all mechanical and tire defects. Drivers are required to give receipts to passengers for all cash fares collected. Careful accounting is made of the receipts on a form giving a complete record of the operation, and each driver is required to sign for the receipts issued to him. Daily reports of ticket sales are made by agents to serve as a further check on cash handled by employees.

Rules for the operation of buses were prepared as soon as this service was put into effect and included practically all provisions that have subsequently been laid down by the Public Utilities Commission of Ohio for the regulation of motor vehicles operating as public carriers. These rules include the following provisions:

(a) Drivers must operate in a careful and prudent manner, with due regard to traffic and use of the way by others, so as not to endanger the life and limb of any person.

(b) Drivers shall be American citizens, twenty-one years of age, of good moral character, must be fully competent to operate the vehicle under their charge, and shall have a certificate of license from the Secretary of State.

(c) No driver shall drink any intoxicating liquor during the time he is on duty, or at any time use intoxicating liquor to excess.

(d) No driver shall smoke any cigar, cigarette, tobacco or other substance while operating a motor bus.

(e) No driver shall carry on any unnecessary conversation with passengers.

(f) Upon approaching any bridge, sharp curve, steep descent or any other dangerous place, or in traversing such bridge, curves, jut way, descent or other dangerous place, the driver or operator of the motor vehicle shall slow down and have the vehicle under complete control.

(g) A driver of a motor vehicle shall bring it to a full stop before crossing the tracks of any steam or electric interurban railroad, such stops to be made not more than 75 ft. from the nearest rail of the crossing and at points where the clearest view of the approaching trains, locomotive or cars can be had. After making the stop hereby required, the driver shall carefully look in each direction for approaching trains, locomotives or cars, and if certain that no such trains, locomotives or cars are approaching, he shall then cross such tracks with the transmission of said vehicle in not higher than second gear. The foregoing does not apply to electric railways within public streets in municipalities.

In addition to the promulgation of these rules, the company has equipped all cars with red flags for emergency use in the daytime and fuses for use at night. All cars are equipped with chains, and the drivers are instructed to use them in slippery weather.

Insurance is carried in compliance with the state law of Ohio, which requires on seven-passenger cars the following total liability: $6,000 for any recovery for any personal injury by any one person, $12,000 for all persons receiving personal injury by reason of one act of negligence, $1,000 for damage to property of any person other than the assured. The insurance against damage by collision is carried by the transportation company. The liability insurance has been placed with old line companies on an experimental basis. Under this arrangement all cars are covered by insurance for a minimum rate and it is expected that the final insurance rate will be worked out at the close of the year on the basis of the car-hours in service, taken from bus drivers' time slips, deducting from them such time as dead layover time at terminals. The company and the insurance companies have co-operated with a view to working out an equitable basis for this form of insurance.

# Bonus for Increased Revenue

### Pay of Employees Goes Up One Cent per Hour with Every Cent of Passenger Revenue per Car-Mile Over Previous Average

A VERY simple profit-sharing plan has been in force on the New York & Queens County Railway since July 1, 1923. It provides that for every cent above 31 cents which the railway earns in passenger revenue per car-mile during any month the wages are increased during the following month one cent an hour over a specified basic wage. Those who participate in this bonus include all transportation employees except the superintendent, all mechanical department employees except the superintendent and shop foremen, all line department employees and all substation employees except the chief engineer. The trackmen are not included, as the service of individual trackmen on the property is far less continuous than with any of the other classes.

The plan was announced by Gen. L. C. Andrews, receiver for the company, last June, and 31 cents per car-mile was the figure set for the men to exceed, because that had been the average receipts of the system subsequent to the appointment of the receiver. The basic transportation wage, to which the bonus is added, went into effect at the same time as the bonus system, and is somewhat higher than that previously in force. It is on a ten-year schedule, like the wages on the other lines in Greater New York, and is as follows:

For motormen and conductors, first year, 47 cents; second year, 49 cents; third year, 51 cents; fourth year, 52 cents; fifth year to ninth year, 53 cents; tenth year and thereafter, 55 cents. Operators of one-man cars receive 5 cents an hour in addition to this regular rate.

In his announcement General Andrews pointed out that the company wanted more revenue and the men wanted more pay. If they would help the company get the revenue, they could have part of it in the form of higher wages. The passenger revenue per car-mile during the previous year had averaged just under 29 cents, and since the receiver had been appointed it averaged just under 31 cents. This was the smallest car-mile revenue of any street railway company in New York. It was pointed out that if each operator would pick up only one more fare for each car-mile of his run, then the average car-mile revenue would be increased by 5 cents and the employees' pay also by that amount. The announcement promised also that each day the company would post at its carhouse the car-mile earnings of the day before and the average of the month up to that day, so that the men could see what their chances were of having a bonus the following month.

There are only two restrictions to the plan. The first is that a man must work at least 150 hours during the month in which the increased earnings are created to receive the bonus during the following month. The second relates to accidents. Where a liability accident results in a settlement in favor of the claimant and investigation has shown that the accident was the fault of the motorman, he is obliged to forfeit thirty days of his increased pay, effective immediately after the decision of the general manager. The announcement also suggested ways in which the different kinds of employees could help. On this point it said:

> HOW TRANSPORTATION MEN CAN HELP TO INCREASE CAR-MILE EARNINGS
>
> By keeping your eyes open and picking up every possible passenger.
>
> By running on time, so passengers learn to count on the cars coming along.
>
> By being courteous to passengers.
>
> By making every passenger want to ride on our lines again.
>
> By encouraging local riding during non-rush hours.
>
> By avoiding accidents that tie up the road.
>
> By taking care that every passenger puts correct fare into the fare box.
>
> HOW SHOP MEN CAN HELP TO INCREASE CAR-MILE EARNINGS
>
> By putting out shop jobs that will stand up on the road.
>
> By putting out cars that are clean and comfortable to ride in.
>
> By working with the trainmen to get cars on the road in time, to avoid dead mileage, and to live up to schedules.
>
> HOW LINE MEN CAN HELP TO INCREASE CAR-MILE EARNINGS
>
> By not blocking the line more than you can help while doing line work.
>
> By getting on the job promptly in case of line trouble.
>
> HOW EVERYBODY CAN HELP TO INCREASE CAR-MILE EARNINGS
>
> By being a booster for the New York & Queens trolley service.
>
> By co-operating with the other men in your department and in other departments in everything that affects the car service.
>
> By working for the interests of our trolley lines in the same way that a man works for his own business.
>
> By making it part of your job to be a salesman of the New York & Queens trolley service.
>
> By keeping on the lookout for anything that will help make service better or cheaper and by telling General Manager Roberts about it.

The results since the plan went into effect on July 1 have been quite satisfactory. During June, 1923, the car-mile receipts were 32.1 cents, so that during July the wages were up 1.6 cents per hour. During July the increased wage earned was 1.4 cents per hour. The record for the year up to March 10, 1924, with corresponding figures for the previous year, follows:

EARNINGS AND BONUS ON NEW YORK & QUEENS COUNTY RAILWAY

Earnings per Car-Mile

| | 1922, Cents | 1923, Cents | Increase, Per Cent | Bonus Payment, Cents per hour |
|---|---|---|---|---|
| June | 29.6 | 32.1 | 8.5 | 1.1 |
| July | 31.6 | 32.4 | 2.5 | 1.4 |
| August | 29.1 | 32.5 | 11.7 | 1.5 |
| September | 29.5 | 32.8 | 11.2 | 1.8 |
| October | 28.2 | 31.8 | 12.8 | 0.8 |
| November | 27.6 | 31.6 | 14.5 | 0.6 |
| December | 27.7 | 32.3 | 16.6 | 1.3 |
| January | 27.2 | 31.8 | 16.9 | 0.8 |
| February | 27.5 | 30.9 | 12.4 | ... |
| March | 30.1 (1 to 10) | 32.5 | 8.0 | ... |
| April | 30.7 | .... | .... | ... |
| May | 33.7 | .... | .... | ... |

It is impossible to say what proportion of the increased earnings, as compared with the previous year, is due to the bonus plan, because there are other factors which have tended to increase the passenger revenue. The management believes, however, that the greater interest taken in their work by the men, particularly the trainmen and inspectors, is responsible to a considerable extent for the better showing.

## Better Illumination with Less Wattage

By E. E. Dorting
Lighting Engineer Interborough Rapid Transit Company, New York

BETTER illumination, aimed to speed up passenger movement within the "L" stations, has been provided by the Interborough Rapid Transit Company in several stations of the Manhattan Elevated. The new lighting system gives, without glare, a maximum amount of light at the turnstiles, with a nearly uniform intensity of illumination over the rest of the station. Four 75-watt lamps in dome reflectors mounted on the ceiling replace the old installations of ten 40-watt bare lamps mounted on wall brackets.

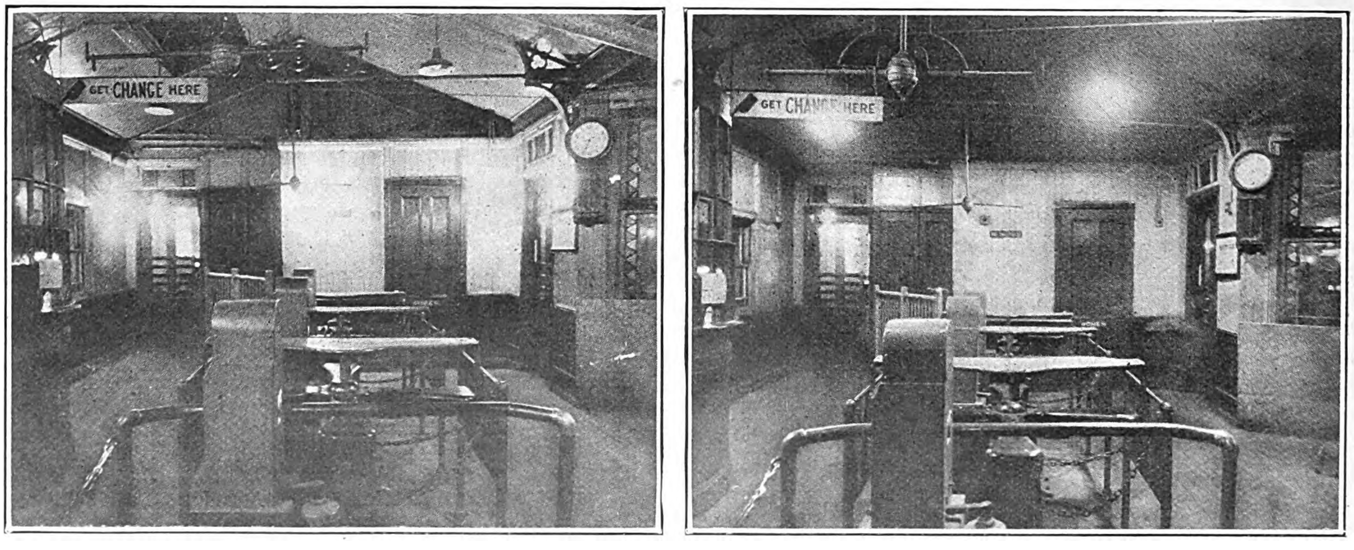
Both the lamp renewal cost and the operating cost are less for the new system. The renewal cost of the four 75-watt white Mazda lamps of the new installation at 55 cents each is $2.20, whereas the ten 40-watt bare lamps at 30 cents each cost $3. Four 75-watt lamps total 300 watts, while the ten 40-watt lamps total 400 watts—a saving of 100 watt-hours for each hour the lights are lighted.

While the Interborough has been confronted with the problem of designing and equipping its stations to handle larger and larger crowds, and traffic experts have arranged stairways, turnstiles and locations of doorways for accommodating a maximum number of people with a minimum of delay and confusion, until recently little consideration was given to the possibility of improved lighting as an aid to traffic congestion. Many tests have proved that a higher intensity of properly diffused illumination speeds up production in a factory, increases sales in a store, reduces traffic accidents. Good lighting is equally applicable to enable the hurrying "L" passengers to move along faster. At least the stations are brighter and more cheerful when they are well lighted, which fact alone warrants the change.

The old lighting system consisted of ten 40-watt bare lamps mounted on wall brackets. These were spaced about the station wall and gave considerable glare. On all sides the lamps threw unshaded light directly into the eyes of the people. The walls were brightly lighted, but there was not nearly enough light in the center of the station, and especially at the turnstiles, where the most congestion exists, and consequently a high intensity of light is important.

The new lighting system of four 75-watt white lamps in RLM standard dome reflectors largely eliminates the shadows. From the standpoint of glare the new installation is much better than the old as the units provide a high quality of well-diffused illumination, while their location close to the ceiling "softens" any glare as they are out of the line of vision.

Photometer readings taken at numerous points in the station show the average illumination to be increased 75 per cent, while over the turnstiles it was increased almost 350 per cent. The present average intensity of illumination in the station at the floor level is approximately 4 foot-candles. This greater effectiveness results from the use of a smaller number of large units equipped with efficient reflectors which direct the light where it is needed rather than allowing it to be wasted largely on the side walls.

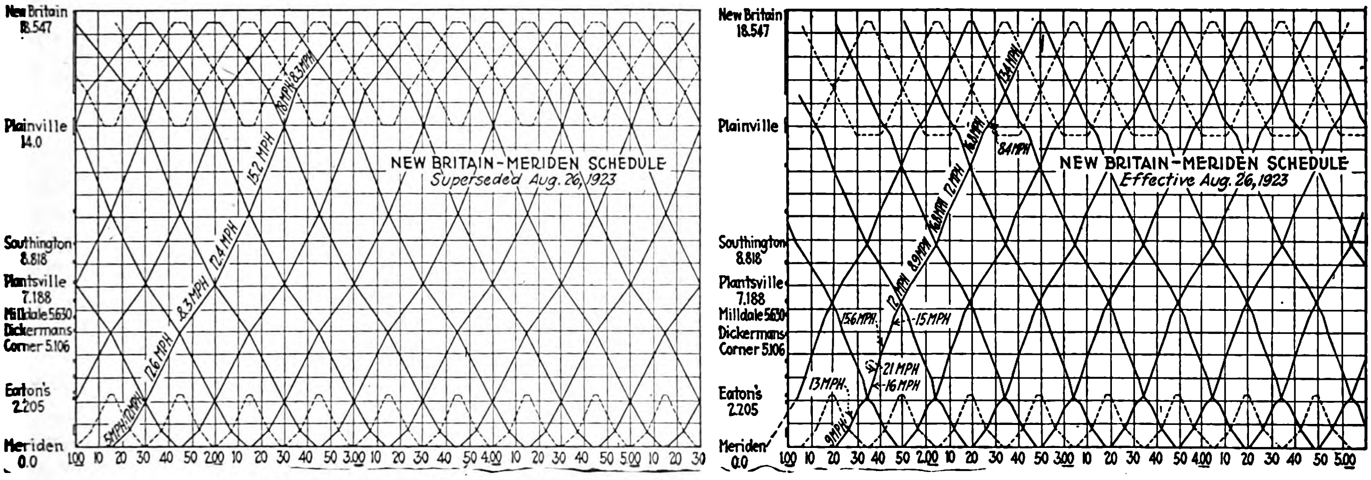


**Old and New Method of "L" Station Lighting**
Ten 40-watt lamps on wall brackets (left) have been replaced with four 75-watt ceiling lamps with reflectors (right), giving 350 per cent better illumination over the turnstiles, without glare.

# Signals Reduce Operating Expenses

### Block Signals Installed by Connecticut Company Pay for Themselves in Six Months by Reducing the Car-Hours Lost on Turnouts

AN INTERESTING example of the way in which block signals reduce the time of cars waiting at turnouts and so save operating expenses is shown by an installation completed last August by the Connecticut Company between Meriden and New Britain. The length of route between the center of Meriden and the center of New Britain is 18.547 miles and, outside of a short section of double track at each end, is single track with turnouts. This track is laid partly in side location, partly in the center of city streets and partly in improved state highways, and the route passes through Milldale, Plantsville, Southington and Plainville. All are fair-sized industrial towns with narrow streets.



One Car Less Is Required to Operate This Half-Hourly Schedule Since Signals Were Installed. Old Schedule at Left, New Schedule at Right.

A portion of the afternoon time-table, from 1 p.m. to 5:30 p.m. before the installation of signals, is given in the first engraving. The through time-table was half-hourly, with an intermediate half-hourly local service out of Meriden as far as Eatons and out of New Britain as far as Plainville. This, with the through service, gave a fifteen-minute headway for short distances out from both Meriden and New Britain. There is also an additional fifteen-minute service, not shown in the chart, from New Britain as far as Corbin Avenue during the morning and afternoon on week days. These three local services are with one-man cars.

The through schedule shown had to be somewhat slack to give the cars ample time to make the turnouts at which they were scheduled to pass each other, and, as will be seen, seven cars were required to give this through half-hourly service. With the introduction of signals, it was possible to tighten up the schedule, so a car would make the half trip in one hour and twenty-eight minutes, instead of one hour and forty-three minutes. This allowed the service to be given with six cars instead of seven cars and gave a more dependable and faster service. While there were no more passing points, their location was changed, so that the change required the installation of two more turnouts. Altogether there are five passing points, but as two are on double track, only three turnouts are required. The old turnouts were left in position for emergency use. The cost of the two new turnouts was about $5,000, including some land which had to be purchased for one of the turnouts.

The cars used are four-motor double-truck cars, equipped with Westinghouse 101 or G.E. 80 motors. The speed given, as shown in the chart, is of course not high, compared with some interurban lines, but it must be remembered that the line passes through several small industrial towns and roads with many automobiles.

Before disturbing the schedule on the line, which had been in operation a great many years, and to which the patrons had become accustomed, the company interviewed a great many people who would be apt to be interested in the change, including the managers of the major industries. The advantages of the plan were explained and the co-operation of the various industries secured.

The cost of installing the signals was about $10,000, and even if the $5,000 spent for the additional turnouts is included as part of the cost of installation, the company estimates that the saving made from running the schedule with one less car pays for the entire improvement in about six months.

## All-Electric One-Man Car in Holland

A NOVEL type of one-man car has been put in operation on the street car lines of Amsterdam, Holland. This is designed along similar lines to its American prototype, according to *Elektrotechnische Zeitschrift*, but differs in that it is not equipped with compressed air, being operated electrically throughout. Double doors, for separate entrance and exit, are provided at each end. These are opened and closed by ½-hp. electric motors with worm drive and slip clutch. The doors can be opened manually if necessity arises.

A dead-man handle is used on the controller, which is arranged to disconnect the motors, apply the brakes and light a red lamp at each end of the car if the motorman removes his hand. A foot-operated by-pass permits the temporary use of both hands for purposes of making change, etc. The car is driven by two 30-kw. motors. An electromagnetic rail brake in installed for regular use, while a hand brake can be used in emergency. The registering fare box is illuminated electrically so that the operator can see within it at night. The window in front of the motorman is inclined inwardly so that it prevents confusing reflections from the lights within the car which would hinder the operator in his work at night.

# American Association News

## Executive Committee

The executive committee of the American Association met at headquarters in New York on April 11. The members present were President Britton I. Budd, Secretary J. W. Welsh, and Messrs. C. L. Henry, R. P. Stevens, J. H. Hanna, C. E. Morgan, C. D. Emmons, H. B. Flowers, R. I. Todd, Harry Reid, H. A. Johnson, J. K. Punderford, E. M. White, Barron G. Collier, M. B. Lambert for H. D. Shute, Cornell S. Hawley and A. A. Hale.

Mr. Henry reported for the committee on national relations, summarizing the recent work done at Washington. The matter discussed by Mr. Henry was covered in the issues of the ELECTRIC RAILWAY JOURNAL for March 29 and April 5. Mr. Welsh presented a report for the committee on subjects and meetings which outlined tentatively the program for the annual convention. The executive committee decided that one day should be devoted entirely to the reports and discussion of the committees on city operation and interurban operation. Otherwise the report of the subjects and meetings committee was approved as presented. It was also tentatively decided to devote one entire day to the inspection of exhibits and to that end there will be no business sessions during one day. Whether this exhibits day will be Tuesday or Wednesday will be decided later.

Mr. Budd spoke briefly of the great desirability of formulating some plan which would tend to make delegates to the convention attend meetings and take an interest in all of the proceedings as far as time permitted, whether of immediate interest in the delegate's own work or not. Suggestions were made that it might be helpful if every employee sent to the convention were required by his executive to report upon attendance and impressions of meetings and exhibits. The executive committee requested the president and secretary to formulate a letter to be sent to member companies to impress upon delegates the importance of attending to business while at the convention.

Mr. Collier reported for the publicity committee, outlining the activities of the past 60 days. E. C. Faber made a financial report on *Aera* for the publication committee, which showed the paper to be improving.

Mr. Stevens reported for the committee on company and associate membership, stating that three railway, one manufacturer and one associate members had been added to the membership. The new members are the Muncie & Portland Traction Company, Portland, Ind.; the Sioux Falls Traction System, Sioux Falls, S. D.; the Eastern Massachusetts Street Railway, Boston; the General Tire & Rubber Company, Akron, and the Buchanan & Layng Engineering Corporation, New York.

Mr. Morgan reported for the committee on individual members and company and community sections that there had been a net gain of five individual members since Nov. 1 of last year, and that there is at present a membership of close to 200 signed up toward the organization of the Metropolitan Community Section of New York.

A letter from W. H. Sawyer gave a preliminary financial report of the Midyear Dinner at St. Louis. The receipts will be approximately $7,500 and expenses slightly below that.

A report of the exhibit committee, which appears elsewhere in this issue, was presented by Secretary Welsh in the absence of J. C. McQuiston, chairman. The report stated that satisfactory contracts had been negotiated for holding the convention at Atlantic City, and recommended that a rate of 65 cents per square foot be charged for exhibit space. This was approved.

**Annual Convention and Exhibits**

*A.E.R.A.*
*Atlantic City, N. J.*

**October 6, 7, 8, 9, 10**

President Budd suggested the appointment of a committee of bankers, with the idea that they would take an active interest in electric railway financial matters and advise the association on these subjects. The association has special advisory committees on nearly every other phase of the industry but none on finance. It was thought that a committee of bankers would not only be of vital assistance to the association but would bring these men more actively into the association work. Furthermore, their knowledge of the association's activities would tend to bring a feeling of confidence with respect to electric railways into the financial circles. A motion was made and carried authorizing the president to appoint a committee to select and secure five bankers to serve on such a committee, preferably all located in New York so that they could readily get together.

F. C. J. Dell read a report for E. F. Wickwire, chairman of the committee on co-operation of manufacturers. In this it was pointed out that 41 manufacturers had been added to the list of those who were actively interested in co-operating with the association. The report stated that the personal visits of Mr. Dell upon manufacturers in various parts of the country had been very well received and that it was thought this would be most helpful in promoting the spirit of co-operation.

On Referendum 43 of the United States Chamber of Commerce on transportation, the matter was referred to the committee on policy with power to act.

An invitation from the international railway association, which is to meet in Paris on June 16-22, was read, but no action was taken as to official representation.

Mr. Johnson reported that the Engineering Manual, which has been revised and prepared for publication in book form by the Engineering Association, would be ready for distribution within the next 60 days. The plan is to print 2,200 copies, of which 1,200 will be bound and the remainder held for binding later if needed, or for binding in sections if companies desire a supply of the matter pertaining to any particular department. The bound volumes will sell to members for $5 and to non-members for $7.50, and a credit of $1.50 will be allowed upon the return of the old Manual. The idea of this refund is to encourage the use of the new Manual in place of the old one, much of which is obsolete. This plan of distribution was approved.

Some discussion was introduced by Mr. Stevens on inconsistencies in the present membership provisions of the association. After an expression of views by several members, the question was referred to the committee on policy with instructions to report back in time for a revision of the constitution to be made at the annual convention, should this appear to be desirable.

The next meeting of the executive committee will be held on Wednesday, May 7, at 4 p.m. in Cleveland, during the annual meeting of the United States Chamber of Commerce, which opens there on Tuesday.

## Exhibits Committee

The committee on exhibits reported to the executive committee on April 11 that it had completed negotiations with the officials in charge of the convention and exhibit facilities at Atlantic City. Proposals for rental of Young's Million Dollar Pier had been submitted by the Associated Realties Corporation and, after considerable negotiation of all terms and conditions, had been made acceptable to the committee, and the contract was recommended for signautre by the association.

The committee had also received proposals from the other contractors at Atlantic City including those for furniture, floral decorations, drayage, etc. These have all been approved.

The committee carefully considered the probable sale of space for this year as well as the expenses to be incurred and formulated the following budget which was approved by the executive committee:

| | |
|---|---|
| **Expenditures** | |
| Exhibit expense | $33,015 |
| General convention expenses | 9,250 |
| Entertainment expense | 5,000 |
| Total expenditures | $47,265 |
| **Estimated Receipts** | |
| Sale of exhibit space—60,000 sq.ft. at 65 cents per square foot | $42,250 |
| Contribution from Hotel Men's Association | 3,500 |
| Total estimated receipts | $45,750 |
| | $47,265 |
| | 45,750 |
| Total Deficit | $ 1,515 |

The committee considered this a very conservative estimate, and believed there would probably result a profit rather than a deficit. The rate of 65 cents a square foot for exhibit space, the same as last year, was recommended. This was approved by the executive committee.

This report and the action of the executive committee assure the convention being held in Atlantic City during the week of Oct. 6.

## Engineering Executive

A MEETING of the executive committee of the Engineering Association was held on April 9 at association headquarters, New York. Those present were President H. A. Johnson, chairman; R. C. Cram, Daniel Durie, C. R. Harte, M. B. Rosevear, C. H. Clark, R. H. Dalgleish, G. C. Hecker and J. W. Welsh.

Mr. Harte reported on the progress of projects being handled with the American Engineering Standards Committee, and Mr. Dalgleish reported on the progress of work in which the Bureau of Standards is co-operating.

Considerable time was given to discussion of the publication of the new Engineering Manual. This is now in the hands of the printers, and it is anticipated that distribution can be begun within a month. The book will contain about 1,000 pages. It was agreed that it should be bound in cloth, uniform with the annual proceedings, and that it be sold to members and others at a price sufficient to cover the cost of publication. It was considered desirable that, in order to retire the existing Manuals, a rebate be allowed on the price of the new book in case an old one is returned.

In addition to the bound volumes it was voted to prepare separate pamphlets in paper covers, divided according to the eight general sections in which the new Manual will be printed, to be sold in response to requests for individual specifications.

The committee adopted a resolution expressing the appreciation of the association to the manual committee, Messrs. Cram, Harte, Durie and Hecker, for the thoroughness with which it has done the work of revision and publication of the new manual.

President Johnson reported that the approval of the American executive committee had been given to the request of the heavy traction committee to have Prof. R. G. Warner prepare a bibliography of heavy electric traction. It is proposed to mimeograph this material and supply it to members and others. The price will be determined later.

Mr. Dalgleish reported that he had several conferences with the Bureau of Simplified Practice of the Department of Commerce relative to the simplification of car parts resulting from an article in ELECTRIC RAILWAY JOURNAL for Sept. 29, 1923. It was agreed that the matter should be referred to the committee on unification of car design.

A sub-committee of the Engineering Association reported on relations with the A. E. S. C. It was felt that a more effective means for handling these activities is needed, as the existence of the A. E. S. C. undoubtedly will have a marked effect on the committee work of the association. Recommendations were made with regard to the procedure so as to safeguard the interests of the electric railway industry. The report was approved for presentation to the A. E. S. C.

Reports were made on a number of projects for standardization, which it was proposed to submit to the A. E. S. C. jointly with the American Society for Testing Materials. These included a specification for hard-drawn copper trolley wire, five specifications for sundry track materials, and one for open-hearth girder rails.

Several other activities were also discussed in which the association is co-operating with other bodies.

Two plans were presented for the program of the Atlantic City convention, one for a four-day schedule and the other for three days. A tentative program was approved subject to revision by the president and the secretary. Approval was given to hold a session of the purchasing agents and storekeepers, similar to that of last year.

An effort will be made to have an exhibit in the association booth showing the A. E. R. E. A. standards.

A recommendation was approved that the committee on subjects be appointed at the beginning of the association year in order to give more time for the consideration of subjects.

## City and Interurban Directing Committee

A NEW committee has been formed to direct the activities of the committees on city operation and interurban operation. It consists of the chairman and one regional vice-chairman of each committee, together with the secretary and a representative of the president. A meeting of this new directing committee was held at New York on April 10. Those present were Chairman H. B. Flowers and Regional Vice-Chairman R. F. Carbutt of the city committee, Chairman Harry Reid and Regional Vice-Chairman H. L. Mitchell of the interurban committee, Secretary G. C. Hecker and E. J. Blair.

It was planned to request the subjects and meetings committee to arrange for the presentation at the convention of a brief report by each regional vice-chairman on his activities. For the preparation of the final report the form of operating handbook originated by Mr. Carbutt was approved as a guide for the collection of information. Arrangements will be made to send copies of the handbook to all regional vice-chairmen for use in their visits to properties.

## Membership

THE committee on company and associate membership met in New York on April 10. Members present were Chairman R. P. Stevens, C. E. Morgan, H. B. Flowers, Edward Dana, H. B. Potter, A. Flor, K. A. Simmon, R. F. Carbutt, Charles W. Kellogg, E. P. Waller, Harry L. Brown, F. C. J. Dell and Secretary J. W. Welsh.

Mr. Stevens reported the results of his extended correspondence with non-member companies, and each member of the committee was assigned the non-members in his vicinity so that he might follow up the correspondence of the chairman by personal call.

## Rapid Transit

THE committee on rapid transit met in New York on April 10 with Chairman W. S. Menden and the following members of the committee present: Edward Dana, B. J. Fallon, James Walker, W. S. Twining, L. H. Palmer, W. H. Maltbie, R. F. Kelker and Secretary J. W. Welsh.

The committee discussed at considerable length the work which might profitably be undertaken by this committee and tried to arrive at the scope of work which it could expect to complete this year. It seemed to be the sense of the meeting that the work should be confined to that of gathering facts as to the circumstances surrounding the construction, financing, operation and regulation of the existing rapid transit systems.

## Coffin Prize

A MEETING of the Charles A. Coffin Prize Committee of the A. E. R. A. was held in New York on April 11. Some suggestions had been made that it might be desirable to have, in addition to the main prize, recognition for other companies in the form of an "honorable mention" or "award of merit" for the four or five leading contenders for the prize. Some doubt was expressed by the members of the committee as to the wisdom of this proposal and a letter from J. G. Barry, vice-president General Electric Company, stated that the proposal had been discussed by the officers of his company and they had unanimously agreed that they believed only the single prize should be awarded. His letter suggested, however, that the practice followed by the committee last year of sending letters to the various contestants, pointing out the principal things in which they excelled, should be continued.

A title for the book which is being prepared by H. H. Norris from the proceedings last year was approved, namely, "Electric Railway Practices in 1923."

Those present at the meeting were James H. McGraw, W. W. Trench, E. J. Blair for Mr. Budd, C. D. Emmons and Secretary Welsh.

# Maintenance of Equipment

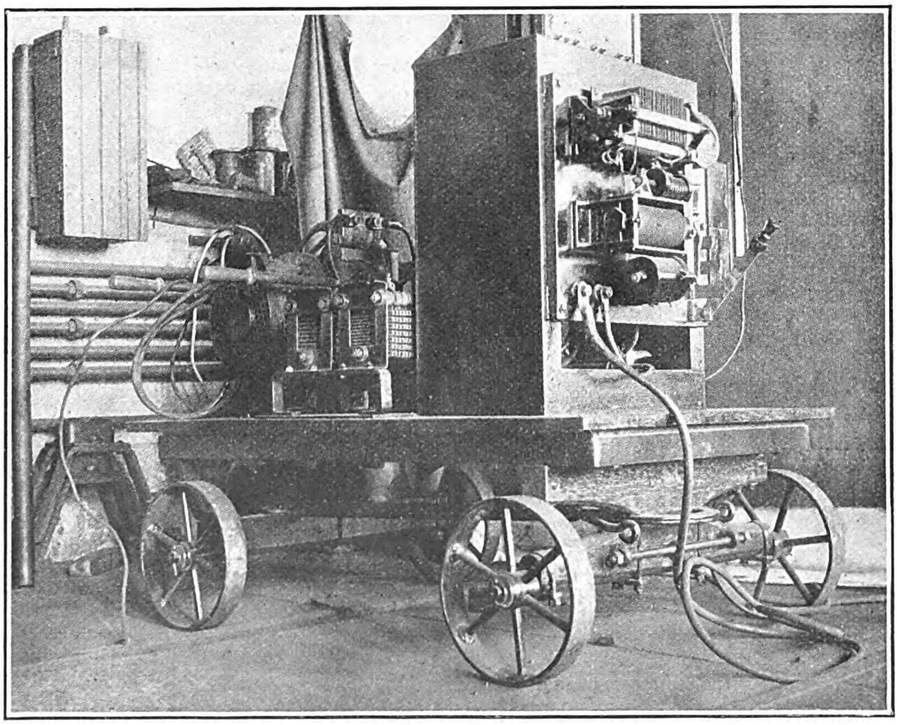
## Making the Welding Set Portable

WHILE a welding room offers facilities that are not available in cases where the welding set is taken to the job, still there are cases frequently occurring where it is inconvenient to take the work to a fixed welding room. Sometimes, by taking the welding set to the job, much work can be saved in dismantling parts which would otherwise be necessary if a portable welding set were not available.

To meet such conditions, the Philadelphia & Western Railway, Norristown, Pa., has constructed a truck for its shop welding set. The various switches and resistance for control of the welding equipment are mounted permanently on top of this truck, as shown in the accompanying illustration. The set can thus be used either in the welding room or at any other point where welding current is available.

The truck consists of a wooden platform with four wheels, the two forward ones being arranged to swivel and thus make short turns readily. In order to make the top of the platform level, the rear end is supported by two straps, which rest on top of the rear axle. A center bearing with support is provided for the front axle, so that this can turn. A rod on the forward side of the front axle provides a means for attaching a handle. This handle is made with hook ends, so that it can be readily attached. When not in use it is placed inside underneath the platform of the truck, so that there is no danger of workmen falling over it, as might occur if it were left projecting out from the truck.

The wheels of the truck have a diameter of 14 in. They were constructed in the shop by bending a band of iron to a circular shape and welding six spokes and a hub in position. The hub is made of a piece of armature shaft. Its diameter is 3 in. and its length 4 in. The axles of the truck are of wood with 1¼-in.-diameter steel rods attached underneath. These are turned down to 1-in. diameter where they pass through the wheel hubs.



Welding Equipment Mounted on Truck for Portability

## Weather Is Primary Cause of Signal Failures

By H. J. Charters

Portland Railway, Light & Power Company

THE annual report of block signal operation on the lines of the Portland Railway, Light & Power Company, Portland, Ore., for the year 1923 shows that adverse weather conditions are the most frequent cause of signal failures. During the summer and fall months the failures are comparatively few, although on account of extra trains the daily signal movements are more numerous than at other times. In June, because of severe electrical storms, there were more failures than in any other month.

ANALYSIS OF SIGNAL FAILURES, PORTLAND RAILWAY, LIGHT & POWER COMPANY

| | 1921 | | 1922 | | 1923 | |
|---|---|---|---|---|---|---|
| | Number | Per Cent | Number | Per Cent | Number | Per Cent |
| Line wires | 5 | 4 | 5 | 7 | 6 | 6 |
| Switch and pole wiring | 2 | 2 | 3 | 4 | 12 | 11 |
| Blown fuses | 7 | 6 | 3 | 4 | 15 | 14 |
| Directional relay | 29 | 25 | 22 | 30 | 34 | 31 |
| Signal trouble | 6 | 5 | 1 | 1 | 3 | 3 |
| Contactors | 44 | 38 | 26 | 35 | 24 | 22 |
| No. 5 switch | 7 | 6 | 2 | 3 | 8 | 7 |
| Miscellaneous | 6 | 5 | 1 | 1 | 0 | 0 |
| No trouble found | 11 | 9 | 11 | 15 | 6 | 6 |
| Totals | 117 | 100 | 74 | 100 | 108 | 100 |

Directional relays and contactor difficulties were the most frequent causes of interruption notwithstanding the fact that the original No. 5 contactors had been replaced by more rugged home-made devices at all points where high speed is maintained. For the last three years the number of contactor failures has shown a steady decrease. Fuses and

SIGNAL FAILURES BY MONTHS AND YEARS

| | 1921 | 1922 | 1923 |
|---|---|---|---|
| January | .. | 6 | 22 |
| February | .. | 5 | 10 |
| March | 10 | 3 | 13 |
| April | 13 | 8 | 8 |
| May | 17 | 4 | 8 |
| June | 9 | 15 | 16 |
| July | 16 | 8 | 6 |
| August | 12 | 1 | 8 |
| September | 8 | 1 | 4 |
| October | 6 | 8 | 2 |
| November | 16 | 6 | 6 |
| December | 10 | 9 | 5 |
| Totals | 117 | 74 | 108 |

switch and pole wiring were also important causes of interruption. Cases where no trouble was found were numerous and constitute a considerable part of the reported failures, but it is felt by the railway that it is better to report a signal out of order and inspect it than to "take a chance."

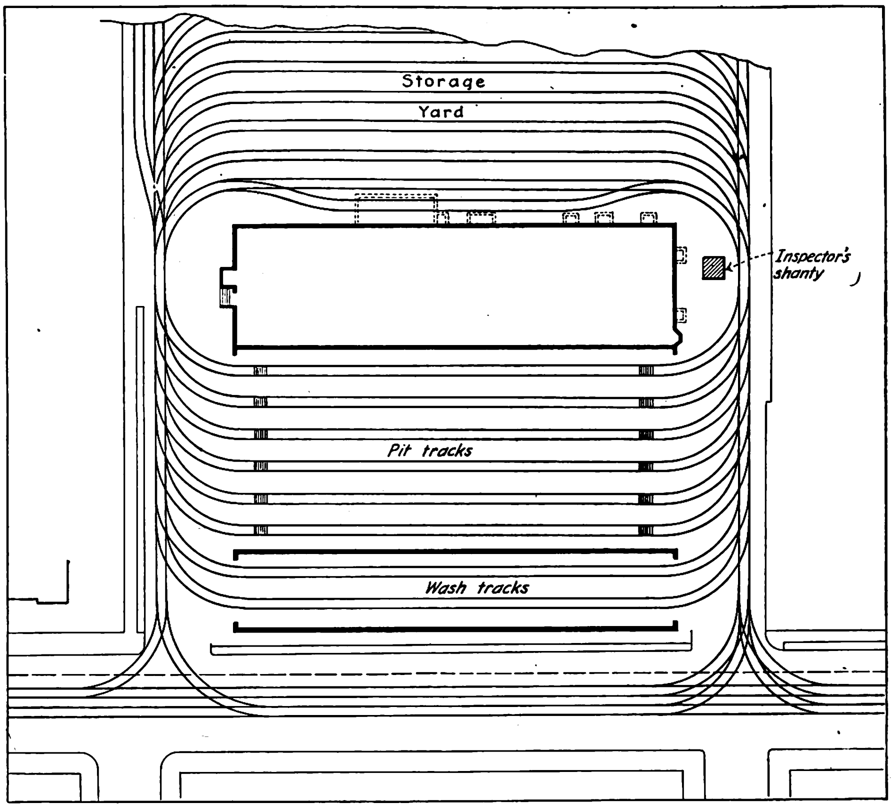
The total number of signal movements during the year was 991,082, the same as during the preceding year. The number of failures was slightly greater on account of bad weather conditions. The durability of the type G1 United States signals, however, has been notable. After being in continuous service for 10 years, they required in most cases nothing but cleaning and adjusting to place them in perfect order.

## Detachable Letterboard Simplifies Spray Painting

THE Boston & Worcester Street Railway has adopted the spray painting method for use on the exterior of its cars. The process is simplified as much as possible by the elimination of striping, lettering, etc. A single shade of brown is used for the entire side. Repainting of cars is done more quickly and cheaply on account of the practice of having a detachable letterboard. This is a long wooden strip about three-quarters the length of the car body bearing the legend "Boston & Worcester Trolley Air Line." When a car is being repainted this letterboard is removed. It can be brightened up by washing and varnish, and the expense of relettering the whole sign can thus be saved.

## A Track Layout that Facilitates Inspection

THE track layout of the North Main Street carhouse and the adjacent yard of the Springfield Street Railway, Springfield, Mass., has been so designed that all entering cars pass an inspector's shanty. The motorman is required to stop at the shanty and find out from the inspector on duty there where his car is to be placed. The storage yard for cars consists of thirty-one loop tracks, each having a capacity of five cars. The entrance from the street and a portion of the storage tracks are shown in the accompanying diagram. The inspector on duty in the shanty makes a note of the location to which he has assigned the car as it enters the yard. By referring to this list, he is able to tell at any moment exactly where any particular car has been ordered placed.

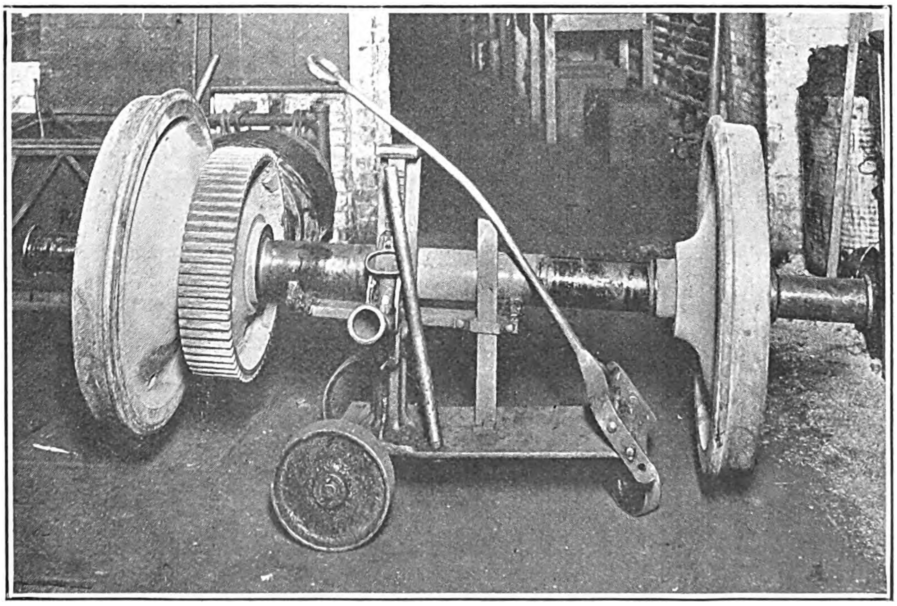


All Entering Cars Must Pass the Inspector's Shanty and Are Assigned by Him to Specific Tracks

A washroom in the house has two tracks and will accommodate ten cars. Alongside of this is a pitroom with six tracks accommodating thirty cars. About twice as many cars are washed and inspected each night as can be placed simultaneously in the washroom and pitroom. The procedure is for the inspector at the shanty to assign the first batch of cars to the washroom and pitroom. The motormen pulling in during the evening leave their cars there. After work has been completed on these cars they are run out into the yard and a second batch brought in.

## Handy Truck for Moving Wheels

A VERY convenient apparatus for moving a pair of wheels mounted on an axle from place to place in the shop has been devised by the welding foreman of the



Simple Cart for Moving Wheels at Worcester

Worcester Consolidated Street Railway, Worcester, Mass. This is a little truck with two 11-in. steel wheels at one end and a revolving castor at the top. On the floor of the truck has been fastened a Barrett jack equipped with a special support to fit a street car axle. This little cart is placed directly under the axle to be moved, and by manipulating the jack the axle is raised sufficiently for the wheels to clear the floor. The cart can then easily be moved to any part of the shop.

# New Equipment Available

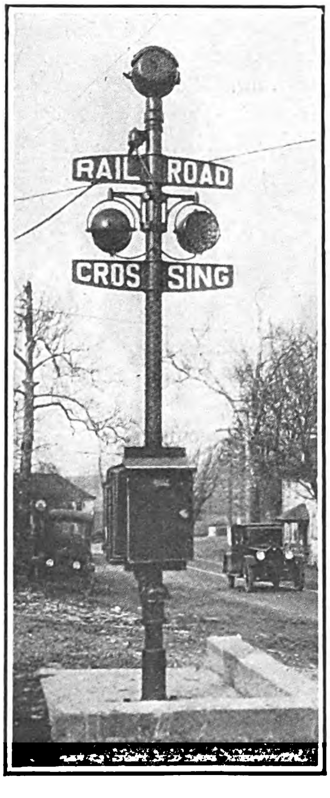
## New Highway Crossing Signal

On its line to Erdenheim, a suburb beyond Chestnut Hill, the Philadelphia Rapid Transit Company recently installed a new type of highway crossing signal made by the Nachod Signal Company, Louisville, Ky. This gives indications by a bell and flashing lights. At this location the double-track trolley line crosses the Bethlehem Pike, a main automobile highway out of Philadelphia on which traffic is quite heavy. The crossing is at right angles to the track at the bottom of a long grade on the highway.

The signal is set on a concrete foundation, with a relay box mounted on a pipe standard, at the top of which is a large bell. Brackets attached to the standard hold two parabolic reflector units each fitted with a red cover glass and a 23-watt lamp. A large portion of the light is projected into an approximately parallel beam, thus giving a brilliant indication by day as well as by night. The projectors are pivoted on gimbals, so that the beams may be accurately directed along the highway in both directions.

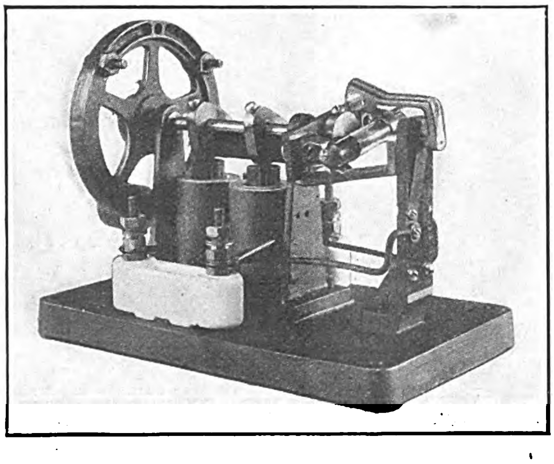
Control of the signal is through overhead trolley contactors of the wiping type, four of which are required for this double-track installation. As the car movements are comparatively slow at this point, the starting contactors are located only a short distance from the highway in each direction.

The light is flashed by a new form of oscillator-type flasher relay shown in an accompanying illustration. The lamp circuit is broken by the tilting of a sealed tube containing mercury, to break the connection between terminals within the tube. On a test of this flasher relay twenty 23-watt lamps on a 600-volt circuit were flashed, the circuit being broken more than 10,000,000 times without any noticeable deterioration of the contacts. The relay base measures 9½ in. x 5¾ in.; it is 7⅛ in. high, and weighs 10 lb. It is said to be noiseless, smooth in operation, and to require little maintenance except lubrication once a month. The flashes are at the rate of sixty per minute in this installation, although the frequency is adjustable.



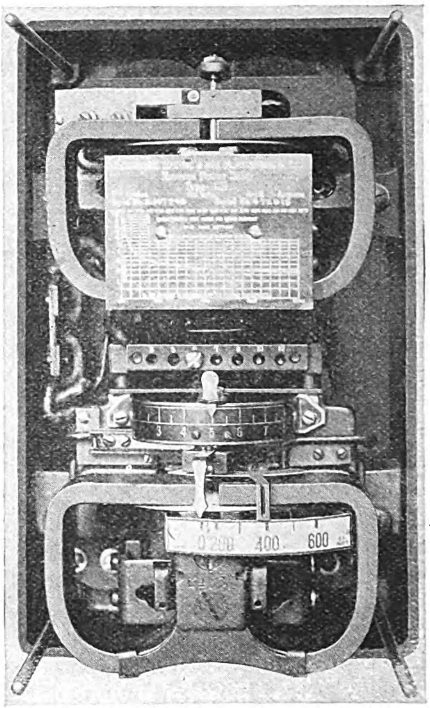
New Signal Recently Installed Where the P. R. T. Crosses the Bethlehem Pike

Below, the Contact in This Relay Is Made and Broken by the Movement of Mercury in the Tube



## Relay with Self-Contained Ammeter

A line of over-current and directional relays equipped with a current-indicating element is a new product of the Westinghouse Electric & Manufacturing Company. These relays, known as COA and CRA, differ from the company's standard CO and CR over-current and directional relays in that they have self-contained ammeters which give a continuous indication of the current flowing in the circuit to which the relay is connected. They are designed for use where the relays are mounted on the front of a switchboard and where there is insufficient room to provide separate ammeters.



This Type CRA Directional Relay Incorporates a Current Indicator

In addition to operating as protective relays, these relays indicate the current flowing through the relay circuit, which not only shows the current in the feeder, but also proves that the relay is receiving current and is in condition to operate if a short circuit should occur.

The indicating element is mounted on a separate shaft and has its own jewel bearing and control spring, but is actuated by the same flux which operates the contacts of the relay. This prevents the indicating element from operating when there is any trouble either inside or outside the relay that would prevent the main electro-magnet from being energized.

# The News of the Industry

## Compromise Transit Bill Passed

### New York City Authorized to Engage in Municipal Operation Under Self-Supporting Fares—Present Transit Commission Continued in Office with Supervising Powers

The Legislature of New York has passed the compromise transit bill for the city of New York and the constitutional amendment authorizing the issuance of bonds to the amount of $300,000,000 for grade crossing elimination, which must be passed by another legislature and receive approval by the people. The Assembly stopped the passage of the Ryan bill, which would have restored 5-cent fares in Troy, and killed the constitutional amendment which would have permitted the city of New York to borrow $275,000,000 for transit construction, which amount would be exempted from the debt limit of the city in the same manner as water bonds are now exempted. All of the administration program for municipal ownership and regulation of public utilities failed to pass in the Assembly.

### GENERAL SESSION DISAPPOINTING

Final decision on many of these things remained an uncertainty, however, up to the last hour. With the desk force of the Senate and Assembly swamped by hundreds of bills amended and passed in its closing hours the legislature adjourned as of April 10. It is said that never before in legislative history in the State has an adjournment been had in such confusion. The clerk had been on practically continuous duty for seventy-two hours. It will be days before the fate of many measures is definitely known.

The compromise bill affecting transportation in New York City was reached as a result of the conference between the Senate and Assembly committees. Substantially the terms of the bill are as follows:

1. All construction and equipment of all new rapid transit railroads, including the determination of new routes, passes to the city.
2. All uncompleted construction under the dual subway contracts is to be under the jurisdiction of the city.
3. The city is authorized to engage in municipal operation or to lease for operation all new rapid transit lines.
4. If the city engages in municipal operation the fare for an initial period of three years shall be 5 cents, but after such time such operation must be self-sustaining, and the revenues sufficient to pay operating expenses, maintenance, interest, amortization and to provide a reserve for depreciation.
5. The powers of the city are to be exercised through a Board of Transportation of three members to be appointed by the Mayor, originally for two, four and six years and thereafter for six years. No salaries are provided, the Board of Estimate and Apportionment being authorized to determine the amount thereof.
6. The present transit commission is retained in office, with power of supervision and regulation of existing rapid transit lines, and the administration of the dual subway contracts, except construction of uncompleted parts and additions and extensions.

The additional power conferred on the Transit Commission by the legislation of 1921 authorizing the commission to adopt a plan of readjustment of existing lines is not disturbed.

All employees of the Transit Commission engaged in construction work will be transferred to the Board of Transportation.

Aside from the transit legislation the New York State legislature closed with less accomplished than in many years. Its chief performance was the passage of a 25 per cent income tax reduction good for 1924 only, the presentation of a home rule measure for cities, much of the interpretation of which will be for the courts to decide, and a constitutional amendment providing for the issuance of grade crossing elimination bonds.

The water power measure was aided by Republication votes, among them Senator Davenport, who declared in voting for the Rabenold bill that the people had spoken at the last election on the defeat of the Ferris amendment to the constitution and that they wanted the ownership of water power to vest forever in the people of the State.

In the Assembly a bill was introduced by Mr. Davison of Nassau county adding a new section, 261-b, to the General Corporation Law, by providing that preference in payment of judgments recovered in actions for torts against public service corporations shall be given in liquidation of affairs of the corporation.

The proposal of the Governor for a commission to devise ways and means to relieve public service corporations of unequal taxation met defeat in the Assembly, the speaker holding that the Davenport committee has already covered most of the gound that such a commission might explore.

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## Use of Canal Bed Urged for Newark Transit Line

Construction of a rapid transit line by either the city or the Public Service Railway, Newark, N. J., along the bed of the Morris Canal between the Pennsylvania Railroad at River Street and Bloomfield Avenue was suggested on April 7 by Thomas N. McCarter, president of the Public Service Corporation. Mr. McCarter stated the case of his company at a conference of the City Commission with representatives of the railroads and the Public Service Railway to determine what should be done with the canal property. The cost of adapting and equipping the property for rapid transit purposes is estimated at $2,500,000. Mr. McCarter said that plans for a rapid transit line such as the company proposed would be ready in about a week and would be submitted to the city.

Five suggestions were made in the Public Service statement on the plans for the use of the canal property. The opening paragraph stated that it was on the "assumption that there is to be within a reasonable time a co-ordinate railway and bus service under one management, furnishing local transportation so that railway financing can be accomplished," that the Public Service made the suggestions.

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## Scranton Strike Settled

After a strike of four and a half days, the cars on the lines of the Scranton Railway, Scranton, Pa., began operating on April 5, following an agreement between the employees and the management whereby the men accepted the rush-hour run with modifications and consented to the matter of wages going to arbitration. Trainmen are demanding an increase of 17 cents an hour.

As was reported in the ELECTRIC RAILWAY JOURNAL of April 5, the management and the employees could not come to an understanding on the demands made by the Amalgamated for a new contract. The management presented a new agreement requesting that the men operate rush-hour tripper service morning and afternoon, with time to be worked on these runs eight hours and the spread to be five hours. After a number of conferences the division agreed to waive all demands in its proposed agreement except wages and rush-hour runs, nor would they arbitrate them.

The men said they would arbitrate the wages, but would not arbitrate the rush-hour runs. Consequently, there was a deadlock until late on April 4, when the men yielded from their stand and agreed to accept the rush-hour runs with the modification of straight time for the morning service and time and one-half for the afternoon service. This the management agreed to since the men waived all other demands and agreed to submit the wage question to arbitration.

The proposal for rush-hour tripper service makes the following provisions:

1. Rush-hour tripper runs operated in the morning shall be paid at the regular rate of wages, for the first four hours or any part thereof.
2. After eight hours continuous time, after schedule time of leaving carhouse the rate of wages shall be paid at the rate of time and one-half per hour.
3. No tripper runs shall exceed thirteen hours from time of leaving carhouse in the morning.
4. All motormen and conductors assigned to regular tripper runs shall be guaranteed eight hours pay at the rates specified in clause No. 2 of this proposal.

## Indiana Union Traction Takes Over Bus Operation

The Union Traction Company, Anderson, Ind., has completed negotiations with the several bus owners of Muncie for the company to take over and operate all lines that have been running more or less regularly since granting the recent court injunction.

By the terms of the sale entered into by the traction company and the bus men, the company buys the rolling stock from the several owners, including not only the half dozen or more large buses that have been running over well-established routes to the different parts of the city, but also becomes owner of touring cars run on irregular schedule during the winter.

While it is extremely probable that a few of the established routes will be changed, it is understood that all of the buses will be continued in use. The plan is to place more street cars on certain runs where street car traffic has always been heaviest. In other places the buses will be used in auxiliary service.

## Rochester & Syracuse Injunction Against Buses

The Rochester & Syracuse Railroad has been granted an injunction by Supreme Court Justice Cheney restraining temporarily the operations of the United Arrow Lines, Inc., operators of a motor bus route between Syracuse and Rochester. The temporary injunction will be in effect pending action for a permanent injunction.

The application for the order was based on the claims that the bus line had cut into the profits of the railway and had operated without authority from the Public Service Commission and the municipalities through which it passed. Fred H. Hout, John Griswold and Norman Waterhouse are named in the order as partners in the bus line.

The Arrow line began operations about March 27 and made two trips daily from Rochester to Syracuse. It operated a 25-passenger Pierce Arrow bus. The fare was $3.90 one way.

## Suburbs of Vancouver to Have Rapid Transit

A new entrance into Vancouver, B. C., is planned by the British Columbia Electric Railway for its interurban lines, which will bring both freight and passenger trains into the heart of Vancouver without the use of city streets. It is estimated that it will cost $1,000,000. At the present time, Central Park, Burnaby Lake and Fraser Valley trains operate over 3½ miles of city streets on which there is a frequent service of city cars. At the point where the private right-of-way ends it is proposed to drop into a short tunnel, then running by means of depressed tracks, using a creek bed to a reclaimed area in the heart of Vancouver known as False Creek. By way of a disused Great Northern Railway right-of-way and bridge, trains will be brought into the back of the company's terminal station. This will cut off at least ten minutes from the running time between Vancouver and New Westminster and virtually bring rapid transit service to the suburban population between the two cities.

## Investigation Completed

### Wisconsin Commission Recommends Double Tracking Most of System and Purchase of New Cars

The Wisconsin Railroad Commission, which has been conducting an investigation of the service of the Madison Railways, has recommended double tracking for virtually all parts of the system as soon as possible and the purchase of seven or eight new cars before next December. The investigation and report were made by C. M. Larson, chief engineer, on order of the state commission following many complaints received from the public during the severe cold weather of last winter.

The report suggests that the people who complain so much in general terms study the service rendered in other cities which compare in size with Madison and they will find difficulty in referring to a place where the service compares favorably with Madison.

Mr. Larson found that cars were overloaded on most of the lines during the morning, afternoon and early evening rush periods, "causing inconvenience and discomfort to the passengers and resulting in delays that slow up cars and distort schedules."

The investigation showed that the company owned 12 miles and 142 ft. of first main track and only four miles and 1,858 ft. of second track. The report recommended that certain parts of the system be double tracked as soon as possible.

In making their investigation, inspectors made counts of the passengers on all cars on all lines at the points of heaviest loading and also made observations of the intervals between cars. Intervals of fifteen to twenty minutes were numerous. Insufficient double track and cars were largely the cause of this condition.

According to the report there was overloading of cars during the morning rush on the Fair Oaks line and during the afternoon rush on the Fair Oaks, South Madison and North Street lines. It was recommended that improvements be made in the block signal system.

The report stated that it was true that during the rush periods larger cars would be much more satisfactory than those now in service. Many more passengers could be handled without the necessity of placing additional cars in service, but it said that there was another feature that could not be overlooked. During the larger part of the day the small cars have sufficient capacity. Larger cars would give no better service and the cost of operating the larger cars would be very much greater than the cost of operating the smaller ones.

Officials of the company expressed their desire to co-operate fully with the commission in carrying out recommendations contained in the report.

## Franchise Extensions Arranged in Birmingham

Thirty-year extensions of franchises of the Birmingham Railway, Light & Power Company, Birmingham, Ala., covering 140 blocks of track were granted by the City Commission on March 25 in consideration of the payment of $35,000.

The steam heating franchise of the company was also extended by the commission for thirty years. The company agrees to furnish free heat to the City Hall and city jail as long as they are maintained in the present location and the present contract remains in effect.

Approximately 90 per cent of the company's franchises were originally granted in perpetuity. The present extensions cover only about 10 per cent of the total.

Another ordinance was adopted providing that the discontinuance of service on any portion of a line with the consent of the city shall not work a forfeiture of the franchise if the company upon ten days' written notice from the city restores service. In the event tracks have been taken up and poles removed, the ordinance provides a reasonable notice in writing with allowance of time to replace the tracks and resume service. This same ordinance provides that in the event the city desires to pave any street upon which the company has a franchise for a double-track line, but has only laid one track, the company must make an election and either forfeit the franchise for one track, or else put down its second track, or as another alternative must pay for the same proportion of the paving it would have paid for had its second track been laid.

## Maumee Valley Railway Ousted from City

The City Council of Maumee, Ohio, a municipality 8 miles south of Toledo, has passed an ordinance ousting the Maumee Valley Railway from operation within the city limits. The ouster was the result of a controversy between the city and the railway over the improvement of the main highway from Toledo to Maumee. The railway follows the highway.

Officials of Lucas County recently decided to widen the road to 27 ft. The Council of Maumee at the same time passed a resolution authorizing the widening of the road within the jurisdictional limits of the city to 32 ft. This would have necessitated taking over part of the right-of-way of the railway.

The city demanded that the railway move its tracks from the west side to the middle of the road. The company protested against the demand contending that the change would involve the expenditure of $85,000, which it was not in a position to undertake at this time.

L. G. Van Ness, president of the railway, said that the proposed improvement would be enjoined or the ruling of the Council appealed to the Ohio State Public Utilities Commission.

## Thirty New Jersey Jitneys Ordered to Suspend

In decisions handed down on April 8 the Board of Public Utility Commissioners of New Jersey disposes of eighty-eight complaints filed by the Public Service Railway against alleged unlawful operation of jitneys in various cities in North Jersey. Thirty jitney drivers were adjudged guilty of unlawful operation and ordered to discontinue service by April 30. In the meantime applications may be submitted to the board for approval of municipal consents to operate buses. Complaints in twenty-six other cases were substantiated, but no order of discontinuance was issued, because applications for state approval have been filed since submission of the Public Service charges. The board will dispose of the question of the necessity for operation of these buses in a decision to be handed down later. Because the Public Service Railway failed to submit evidence in thirty-two other cases the complaints were dismissed.

## Automobile Body Comments on Akron

The National Automobile Chamber of Commerce says that a great deal of misinformation grew out of the twenty-seven days' war at Akron. That body says that in the excitement it was utterly lost to view that the motor bus industry and the electric railway industry both join in the belief that the function of the motor bus and the street car—two distinct agencies of transportation—is to furnish co-operative transportation by means of co-ordination. The chamber says that the bus and the street car have not been, and are not, at war to exterminate each other. Complete motorization of a city's transportation service has not been the desire or the hope of the motor vehicle industry.

The statement by the chamber was prepared at the suggestion of a number of papers that wanted the story. In its statement the chamber further said:

> What has happened in Akron cannot be considered proof of any of the following hypotheses: That the motor bus as an agency of transportation fails to measure up to the street car; that the public prefers street cars because of certain positive advantages; that complete motorization of transportation is impracticable in a city the size of Akron.
>
> None of these points was supported by proof because of the confusion attending the sudden suspension of street car service and the over-night efforts of the city administration to induce free lance bus operators from various parts of the country to install bus service. The experiment was tried under the most unfavorable conditions as far as buses were concerned—whether one views the situation as a supporter of complete motorization or with the well-considered viewpoint of the motor vehicle industry which believes in co-ordination of buses with street cars to improve public service.
>
> The chief difficulty was that the city administration could not guarantee to a bus operator any franchise or stated period of operation. Not even a license could be given or even guaranteed; insurance could not be obtained, and inasmuch as the time was too short to get permits from the Public Utilities Commission there was not only no regulation of these common carriers, but contentions arose that laws were being broken.
>
> As a result, responsible bus operating companies having adequate and up-to-date equipment could not be induced to invade the Akron field. Only those willing to take a chance were attracted to Akron. The response was from the widest variety of free lance operators; their equipment was not regulated in size or type, and much of it was worn out or certainly inadequate.

## Bus Extension in District of Columbia Authorized

The Public Utilities Commission of the District of Columbia has authorized the Capital Traction Company to extend its bus line, now operating between Randle Highlands and Seventeenth Street and Pennsylvania Avenue, Southeast, to the Eastern High School. The rate of fare is to be the same as the current rate of fare in force on the railway lines in the District of Columbia, or such other rate as may be prescribed by the commission. The commission also ordered that transfers between this extension of the bus line and the railway line of the company be issued at 2 cents each. The order is to take effect on May 15.

In authorizing this extension the commission stated in its report that the operation of a bus service over the route covered by the application of the Capital Traction Company would be of advantage not only to those desiring to go to the Eastern High School, but to the residents of the section south of East Capitol Street and east of Thirteenth Street, who are now without adequate transportation facilities. Further, that the operation of this bus line would not conflict with any of the bus routes the Washington Railway & Electric Company had indicated its willingness to operate in the eastern section of the city.

## Offers Counter Fare Proposition for Jacksonville

At the conclusion of the hearing before the Florida Railroad Commission on the petition of the Jacksonville Traction Company for an increase in fares, Peter O. Knight, chief counsel, submitted a counter proposition to the city attorney's request that the cash fare be left at 7 cents and that twenty tokens be sold for $1. Mr. Knight's plan would afford the car riders a lower fare than the present one of 7 cents. The offer called for a cash fare of 10 cents, the sale of five tokens for 35 cents and the sale of weekly tickets at $1.25. In other words, patrons who would not care to purchase tokens would pay 10 cents for a ride. If they desired tokens, they could ride at the same fare now in effect, and if they bought a pass they could ride an unlimited number of times for the week for $1.25.

City Attorney Strum, in answer to the offer advanced by Counsellor Knight, declared that a cash fare of 10 cents would more than offset whatever good the token and ticket sales would do. He contended that he had not sought a straight 5-cent fare, but wanted the 7-cent cash fare retained, allowing patrons to ride for 5 cents on tokens. He said that to increase the fare above 7 cents would tend to decrease the number of car riders, which had already been dropping off considerably. To the contrary, Attorney Knight argued that the automobile had permanently affected the patronage of the railway and that the company's only hope was to get more money for its service.

He stated that the company had paid in dividends to its stockholders $744,000 during the past twenty-two years. He said that it had paid the city $371,438 in gross receipts taxes, $736,000 for paving and $254,000 in free rides, making a total of $1,361,000 paid to the city during this period.

The Railroad Commission reserved decisions.

## Pittsburgh Men Present Demands

Following a joint conference on April 4 of the company's representatives and the wage scale committee representing the men it developed that 3,000 trainmen of the Pittsburgh Railways, Pittsburgh, Pa., are seeking an increase in wages from the present 67 cents an hour limit to the maximum rates of 75 and 77 cents. A new phase of the matter is the part the city is to play in the controversy.

The demands include a two-year schedule. Up to the present the wage agreements have been on a one-year basis. The wage demands for the two-year period, the second year's rates being a 2-cent an hour increase over the first year's rates, are as follows:

For the year May 1 to April 30, 1925: First three months, 68 cents an hour; next nine months, 73 cents an hour; a year or more, 75 cents an hour.

For the year May 1, 1925, to April 30, 1926: First three months, 70 cents an hour; next nine months, 75 cents an hour; after one year, 77 cents an hour. The present rates of pay are 60 cents for the first three months, 65 cents for the next nine months and 67 cents for those employed a year or more. The present agreement between the company and the carmen expires April 30.

## Estimate Board Approves Subway Extension

The Board of Estimate of New York City on April 4 approved a report of Arthur S. Tuttle, its chief engineer, recommending a route for a subway extension of the Fourteenth Street-Eastern subway, and rejected the route submitted by the Transit Commission.

The route approved is somewhat shorter than that submitted by the Transit Commission and was evolved by Mr. Tuttle and Edward Riegelmann, Borough President of Brooklyn. Mr. Tuttle reported that the chief engineer of the Transit Commission had agreed that the substitute route was feasible and it was said that the commission would probably approve it. The cost is estimated at about $14,000,000.

The extension is proposed as an underground line and will connect two units of the B.-M. T. system, joining the Fourteenth Street-Eastern subway at Meserole Street, Brooklyn, to the elevated system at East New York and spanning a distance of approximately 3 miles. The Transit Commission advocated a similar extension with a large part of the line elevated.

The company's estimate of additional wages to be paid amounts to $1,638,000.

# Foreign News

## Swiss Electrification in 1924

The Swiss Federal Railways construction program for the current year, totaling 72,342,550 francs, provides for a substantial amount of electrification. Conversion to this form of operation has been progressing for a number of years, until with the completion of this season's construction all but 260 miles will have been electrified. The program for electrification will be accelerated as much as possible this year, work having begun on the Lucerne-Basel, Thalweil-Richterswil, Zurich-Bern, Sion-Lausanne, Lausanne-Vallorbe-Yverdon lines, a total of 242 miles. The Renens-Geneva line is also on the program for this year.

## P-L-M Electrification Progress

The Paris-Lyons-Mediterranean line is at present electrifying that portion of its main Franco-Italian section between Culoz (the junction for Bellegarde and Switzerland) and Bardonneche, Italy, via Modane and the Mont Cenis tunnel.

This portion of the line centers around the summer capital of Aix-les-Bains, and on to the Italian frontier. It is the most scenic length of railroad in France; that electric traction, observation and tourist cars should here be first tried out is not astonishing.

The work already would have been put through to Culoz but for the difficulties of the company in securing right of way for its transmission lines across certain private properties of this virtual mountain fastness. It finally was necessary to obtain from the government a public decree and authorization to expropriate the necessary rights. It is doubtful if electrical operation will begin this summer, as was hoped.

## Paris Tramway Profit

The Eastern Paris Tramway Company (the unit of the "Transports en Commun" running eastward from the center of the city) announces a net profit of 3,181,931 francs for 1923. This is sensibly the same as for 1922. The company owes for material and supplies 6,754,189 francs, but has carried to reserve for the amortization of bonds the sum of 1,724,790 francs.

## New Electric Lines for Upper Savoy, France

The governmental authorities of the French department of Haute Savoie have decided on the construction of electric car lines from Annecy to St. Julien and Annecy to Seyssel and also electrification of the line from Annemasse (the Swiss frontier station) to Samoens, with an ultimate extension as far as the village of Sixt. Another branch line will tap in midway on this latter route. On the Annecy-St. Julien line there will be a reinforced concrete bridge with a single arch of 150 m. crossing the River Usses at a height of 147 m.

Work has already begun. The railway construction will be in the hands of separate contractors from those who will build the 45,000-volt transmission lines to serve the railway and to provide light and power along the lines.

## Glasgow Studying Subway Situation

Steps are being taken for improving the service, and ultimately of changing over the system from cable to electric traction, of the Glasgow Subway Railway, which recently was purchased by Glasgow Corporation.

The Tramways Committee is considering engineering and traffic reports made by city officials, and plans have been called for to provide improvements in the approaches to certain stations, and to install underground sidings where car repairs can be carried out. This work is all being planned with a view to the electrification of the system. It also was arranged that the waterproofing of the tunnels should be completed.

## London Strike Settled

April 1 marked the end of the strike of London tramway employees and the sympathetic strike of London, the General Omnibus Company employees, which began March 22 and continued during the following week. The earlier events were described in this paper last week on page 558. The workmen stood out for an increase in wages of 8s. a week, which the employers said they could not afford to pay. After a few days the trade union representing railway locomotive drivers and firemen announced that unless a settlement was arrived at by March 28, they would call out their members employed on the underground railways and on the electric suburban lines of the main railway systems. By this time the Prime Minister and other members of the Government were taking an active part in the negotiations for a solution, on account of the seriousness of the situation. The Government announced that if the threatened extension of the strike took place the Emergency Powers Act would be brought into operation and everything possible done to maintain passenger transportation in London. On March 28, however, the representatives of the men agreed tentatively to a new offer made by the employers. This provided an immediate advance of 6s. per week for the uniformed men, that the war bonus part of wages should not be affected till the cost of living index figure dropped 8 points below 75, and that wages should be further increased by 1s. for each rise of 4 points. To grades other than the uniformed staff the offer was an increase of 4s. a week immediately and the other terms as above. These proposals were submitted to a vote of the men. The ballot was taken on March 31, and resulted in the acceptance of the terms by 9,428 votes against 4,377. The services of tramcars and buses were resumed next day.

## Interurban Subway Proposed in France

The city engineer of Tourcoing, which with Roubaix and Lille forms a triumvirate of industrial cities with perhaps the most intense interurban traffic in France, has brought forward a project for a new line to connect Turcoing and Roubaix. The route would be underground for 4 or 5 miles, the remaining 6 or 8 miles being either at surface level or elevated. Traffic conditions have here become such that something of the sort was obviously demanded. Trains under a ten-minute headway were proposed to supplement the present tramway services, which are said to be about the best of their kind today in France, even though in the reconstructed, invaded regions.

The proposition provided for an extension at some future time in the form of a belt subway linking the three industrial cities and the intermediate villages, with double tracks and trains running in both directions.

**Continuation of Weekly Pass Recommended.**—The manager of the Bradford Corporation Tramways has recommended a continuation of the weekly pass system, which has been under trial. This has caused a certain amount of local criticism, as it is averred that business houses are gaining an advantage by purchasing bundles of passes for their employees. It is also said that the post office is saving £150 a week, as passes have been supplied for the postmen, who may use the pass as often as twenty-five times a day.

**Bordeaux Tram and Omnibus Profits Off.**—The annual report for 1923 of the Tramways Electriques et Omnibus de Bordeaux shows a net profit of 2,267,844 francs, as compared with 2,578,627 in 1922. The section within the city limits brought in 1,889,052 francs of the total and the suburban lines the remainder.

**Assets Turned Over to New Company.**—At a general meeting of the Belgian company which owns the Ottoman Tramways and Electricity Company of Beirut, a concession of Syria, now under French mandate, the conditions were fixed upon which the company assets will be turned over to the new French company. The French company will pay 6,000,000 French francs to the Belgian company, which will retire the Belgian stock and bonds by exchanging for those of the French company to the value above set forth. The stock carries 7 per cent and the bonds 4½ per cent interest.

**Tube Railway Proposed for Manchester.**—The Manchester, England, City Council has appointed a committee to consider the desirableness and feasibility of an underground electric railway running beneath the main arteries of the city and suburbs, and to investigate the probable cost.

# Financial and Corporate

## Pittsburgh Receivers Report

### File Final Accounting Covering Their Stewardship for Period Since 1917

The receivers of the Pittsburgh Railways have filed a final accounting in the affairs of the Pittsburgh Railways during the last six years. A feature of the report, which summarizes the six years' work, is that receipts from fares in 1923 increased almost 70 per cent over the amount in 1917, the year preceding the receivership.

The receivers handled $118,606,987 in fares, improved equipment at least 50 per cent and, about two months ago, turned back the property to its owners in good condition, with more than $3,000,000 in free cash.

The receipts of the company, as outlined by the receivers, by years follows:

| | |
|---|---|
| 1917 | $13,551,135 |
| 1918 | 14,192,065 |
| 1919 | 16,628,936 |
| 1920 | 21,494,795 |
| 1921 | 21,731,944 |
| 1922 | 21,580,464 |
| 1923 | 22,978,783 |

With one exception, 1922, each year under the receivership has shown an increase in receipts over the previous years.

The cash in the hands of the receivers on Jan. 31, when the company was turned back to its owners, the report discloses, was $3,282,715, and the accounting adds:

> Against this sum there were outstanding the current bills and monthly payrolls due on that date, and which were assumed by the corporate company.

The seven years' receipts recorded cover also a period in which the fare went from 5 cents to the present 8⅓ cents, or three tokens for a quarter. In 1918, when the fare was increased from 5 cents to 5½ cents and then to 5 and 7 cents, or zone fares, the receipts jumped more than $600,000; in 1919, when in July the fare was raised to 7½ cents, or four tickets for 30 cents, receipts increased about $1,500,000; in 1920, when in September the fare was raised to the present 8⅓ cents, receipts increased nearly $3,000,000. In 1922, receipts dropped about $150,000. This decrease was attributed to industrial depression, for in 1923, fare receipts increased again another $1,500,000, reaching $22,978,783, the highest figure ever recorded in the history of the Pittsburgh company.

Then the receivers' accounting goes into what they have attempted in the way of rehabilitating the property. Buying for cash, they point out, they purchased, first twenty-five new cars, then forty, then twelve, then fifty-five cars, with an option for twenty more, or a total of 152 new cars.

The accounting continues:

> Earnest and continued efforts were made to comply as near as was possible with the recommendations of the commission. Maintenance of way and structures expenditures were increased from $1,394,540 in 1918 to $3,410,489 in 1923, and the amount of new track laid during each of the past four years was: 31.34 miles in 1920, 23.7 miles in 1921, 45,84 miles in 1922 and 41.83 miles in 1923.
>
> During the period of the receivership a total of nearly $600,000 has been expended on repairs and reconstruction of bridges.
>
> It is of interest to note that of the various items of work formally demanded in petitions to the court, by the city of Pittsburgh and other municipalities, while each could not be undertaken at the time of original presentation, practically all have been eventually performed and completed.
>
> In this connection earnest effort was made during the year 1923 and January, 1924, to bring to full completion and conclusion every one of the possible 263 items of work in progress during 1923, with the result that the accounts were closed on all but fourteen.

## Stabilizing Fund Shows Profit in March

March operations of the Community Traction Company, Toledo, resulted in a profit of $2,617 for the stabilizing fund after all charges under the Milner ordinance were made. A heavy maintenance was set up for the month to take care of track repairs during the summer months. This added about $15,000 to the expense as compared with a year ago. In March this year the maintenance set-up was $70,000.

Gross revenue for the month was $374,723 and operating and maintenance expense $307,025. This left net earnings from operations of $67,698 for the payment of capital charges, depreciation, sinking fund and other fixed charges. After these the net to the stabilizing fund was $2,617. The number of revenue passengers carried was 5,415,974 in March as compared with 5,813,634 for the same month a year ago.

Due to increased fare, however, there was an increase of 5.3 per cent in revenue. Total passenger revenue was $349,953 this March as compared with $331,180 a year ago. Decrease in riding is attributable in part to greater use of private automobiles and a slight tendency for industry to slacken in March.

## Toledo & Western Operates Under New Management

The old Toledo & Western Railroad, Toledo, Ohio, was taken over by a new company on April 1 with its one-time receiver, Albert Swartz, in complete charge of operations. The road was purchased from Frank R. Coates of Henry L. Doherty & Company by the Willys-Overland Company and the Wabash Railway about a month ago.

The Ohio Public Utilities Commission has authorized the purchase of the road for $200,000 and the issuance of $500,000 of common stock of the Toledo & Western Railway, as the successor company will be known. It is understood that work on improvements at the Toledo terminals will be under way in a few weeks. A new right-of-way and land development for factories and home sites will be part of the plan.

## $150,532 Loss in Providence

### Earnings Affected by Unusually Severe Winter and Unavoidable Delay in Putting in Economies

The total revenue of the United Electric Railways, Providence, R. I., for the year ended Dec. 31, 1923, was $8,104,043. The net loss from operation for the year, after deducting all operating expenses, interest, taxes, depreciation, etc., was $150,532. As the company is subject to the jurisdiction of the Interstate Commerce Commission and is required to keep its accounts in conformity with the methods prescribed by the commission, the difference in the amount of the net loss from operation for the year as shown by the auditor's statement and the amount of the net loss of $69,501 shown by the company's report filed with the Rhode Island Public Utilities Commission is explained by the treatment of certain items during the year to conform to the requirements of the Interstate Commerce Commission.

On Dec. 24, 1923, the Public Utilities Commission of Rhode Island entered an order approving the issue of $1,455,000 par value, prior lien mortgage, twenty-five year, 6 per cent gold bonds, Series C, and $624,200, par value, common capital stock to be applied to reimburse the company for cash expended for extensions, betterments, improvements and the acquisition of new property in the amount of $2,079,227. Conditions being unfavorable to the advantageous marketing of the company's securities on Dec. 31, 1923, only $450,000 par value of Series C, prior lien mortgage bonds had been nominally issued, and these were pledged to secure notes for loans necessary to furnish money for the company's immediate needs. The company explains that when improved conditions permit the sale of these bonds to advantage, the proceeds will be available for further additions and betterments to the company's property as may be required.

During the year 1923 dividends were declared and paid amounting to $206,267, the last dividend payment having been made July 2, 1923.

CONDENSED INCOME AND SURPLUS ACCOUNT OF UNITED ELECTRIC RAILWAYS FOR YEAR ENDED DEC. 31, 1923

| | | |
|---|---|---|
| Total revenue from all sources | .......... | $8,104,043 |
| Operating expenses | $6,499,299 | |
| Depreciation | 736,316 | |
| Taxes | 341,618 | |
| Bond interest and other deductions from income | 677,342 | 8,254,575 |
| Net loss from operations for the year | ......... | $150,532 |
| Less: Miscellaneous adjustments of prior years' expenses | ......... | 120,072 |
| Deducted from surplus | ......... | $30,459 |
| SURPLUS ACCOUNT | | |
| Balance Jan. 1, 1923 | ......... | $1,747,457 |
| | | $1,716,99[illegible] |
| Less: Dividends paid | $206,267 | |
| Paid to bondholders in consideration of reduced rate on P. L. bonds, Series A | 45,040 | 251,307 |
| Surplus Dec. 31, 1923 | | $1,465,690 |

In September, 1922, an announcement was made that a reduction in fares would become effective Jan. 1, 1923, by the sale of ten tickets for 50 cents with a 6-cent cash fare. Labor and material prices began to rise, however, and this, with the severe winter conditions, unavoidable delays in receiving new cars and power station equipment and other adverse conditions, brought about a situation which made necessary the passing of further dividends in 1923.

On Nov. 22, 1923, the company filed with the Public Utilities Commission a new tariff providing for the sale of nine tickets for 50 cents instead of ten, this tariff to become effective on the thirty days' notice required by law. On Dec. 24, 1923, this new rate of fare became effective. It is expected that this change will increase the revenue of the company $422,000 annually.

The new rate of fare will not, however, produce sufficient revenue to meet the cost of service, including in the term "cost of service," in addition to operating expenses, depreciation and fixed charges, the payment of 6 per cent on capital, which is as much a part of the cost of service as the payment of wages to labor. In consequence, application will be made for a rate of fare sufficient to meet the cost of service.

During the year 1923 the company placed under one-man operation sixteen of its lines, making a total of twenty-eight lines now under one-man operation. During the morning and evening rush hours, however, these cars are operated by two men.

During 1922 the company operated 1,781,641 passenger car-miles more than were operated in 1921, or an increase in service of approximately 13 per cent. During 1923, the company operated 16,783,773 passenger car-miles, an increase of 1,129,475 over 1922, or 7.2 per cent, and an increase over 1921 of 2,911,117 miles, or 21 per cent. The term "car-miles" includes passenger and bus miles.

During the year 1922, 126,209,026 revenue passengers were carried. In 1923, 138,578,286 revenue passengers were carried, an increase of 12,369,260 over 1922, or 9.8 per cent.

## $42,166 Balance in London, Ont.

The net income balance for the year ended Dec. 31, 1923, of the London Street Railway, London, Ont., amounted to $42,166. The gross earnings were $693,411, of which $685,608 was from passengers alone. The total operating expenses were $572,082. Compared with 1922 the gross earnings showed an increase of $98,827 and the operating expenses also increased $77,096.

In his annual report, President Charles Currie referred to the company's loss due to the competition of buses. He says that this condition was eliminated in February of last year, when the city demanded from the bus operators reasonable protection for the public against accidents. Early in 1923 the company itself established a bus service for the distance of 1 mile, operating through a growing section.

He refers to the question of municipal ownership being taken up by the City Council during the latter part of 1923. He says that after considerable negotiations the company and the city were unable to agree on a price to be submitted to the voters, and that as a result the Council did not submit the question to a vote of the people at the regular election held in December.

## Seeks Issue Approval

### Birmingham Electric Company Wants to Float $8,000,000 in Securities—Tidewater Sale April 15

The Birmingham Electric Company, which company recently purchased the properties of the Birmingham Railway, Light & Power Company, at Birmingham, Ala., filed application April 5 with the Alabama Public Service Commission, at Montgomery, for approval of the issuance of $8,000,000 securities and the transfer of the old Birmingham Railway, Light & Power Company to the Birmingham Electric Company. The commission set April 16 for the hearing of these applications.

The application for the transfer of the old Birmingham Railway, Light & Power Company to the Birmingham Electric Company states, among other things, that as a result of the reorganization more than $5,000,000 of securities and obligations of the Birmingham Railway, Light & Power Company, including its $3,500,000 of preferred stock, will be eliminated from securities senior to the new company's stock and become part of the equity represented by the common stock.

A second application is for the approval of the issuance of securities by the Birmingham Electric Company, which include $8,000,000 of 6 per cent bonds to be due in 1954, 20,000 shares of no par value preferred stock entitled to a dividend of $7 a share each year, and on any distribution of assets entitled to payment of $100 a share, or a total of $2,000,000, and an issue of no par value of common stock to represent the equity in the property.

It is stated that substantially the entire proceeds of the new bonds are required for payment of existing 5 per cent first mortgage bonds and 6 per cent refunding and extension mortgage bonds of the old Birmingham Railway, Light & Power Company, and the payment of claims filed in the receivership proceedings against the Birmingham Railway, Light & Power Company.

Up to the present time there are no inquiries as to the sale of the Tidewater line, which is advertised to take place at public auction about April 15. There were no bidders at the two former sales. The Birmingham Railway, Light & Power Company operated the Tidewater for some time past, but its successor is under no obligations to continue to operate the line. Officials say the Tidewater line has one of two things in store for it—rearrangement on an economic basis or the junk pile.

The Tidewater line is about 14 miles in length. It operates from East Lake to Ensley. Several miles of the trackage of this line is operated through territory not yet developed. Moreover, the Birmingham Railway, Light & Power Company has been operating two lines to Ensley.

## Chelsea Leasing Bill Likely to Pass

The committees on street railways and metropolitan affairs of the Massachusetts Legislature has voted to report the bill to the Legislature for the state to take the Chelsea division of the Eastern Massachusetts Street Railway and then lease it to the Boston Elevated Railway.

Under the terms of the bill the Eastern Massachusetts will receive $3,000,000 for the property located in Boston, Chelsea, Revere, Malden and Everett, and of this sum the Elevated will eventually pay $2,000,000 and the communities which are benefited will pay $1,000,000, to be apportioned in a conference of their representatives.

The measure as drafted has the approval of the two roads and of the city of Boston. It is regarded as the most important step taken in the Massachusetts Legislature in many years toward the solution of a difficult transportation problem, affecting particularly Chelsea and Revere. It will mean the extension of through service and a 10-cent fare to those communities, including Revere Beach.

Mayor Curley of Boston believes that the change will cost the city of Boston about $10,000 annually, but he is wholeheartedly in favor of it. He contends that it even will facilitate the movement for a Greater Boston by the merging of the independent municipalities. The proposition has had such smooth sailing this year in the Legislature that the prospects of its enactment into law are good.

## St. Louis Details Not Yet Arranged

A member of the committee which is working on the plan for the reorganization of the United Railways, St. Louis, Mo., said on April 8 that although no fixed plan could be announced, the agreement contemplates that the $30,000,000 outstanding general mortgage 4s, due in 1934, will remain outstanding, as the committee has been advised by counsel that there will be no permanent default in these bonds if certain legal requirements are met.

These bonds, it was said, are technically in default because of the default in about $6,000,000 of the underlying bonds which matured last year. Necessarily the receiver's certificates, the underlying bonds and other temporary or past due obligations will be provided for, the plan being largely confined to the St. Louis Transit Company 5s, of which $9,790,000 are outstanding, the St. Louis & Suburban Railway general 5s, and to the preferred and common stocks.

The plan also contemplates the conversion of the $9,790,000 Transit 5s which mature next October into preferred shares of the same amount, thus reducing the bonded indebtedness of the company, and proposes the conversion of the present preferred stock into common shares of no par value, thereby reducing the charge for dividends.

The immediate undertakings of the committee will be to determine, with the Public Service Commission, a proper valuation of the properties, and then to arrange for a new franchise "which will insure proper service and protection to the car-riding public."

The committee which has evolved the tentative plan for ending the five-year receivership consists of F. O. Watts, president First National Bank of St. Louis; William P. Gest, president Fidelity Trust Company of Philadelphia; J. K. Newman, president Newman, Saunders & Company, Inc., New Orleans and New York; A. L. Shapleigh, president United Railways, St. Louis, and J. Shephard Smith, vice-president Mississippi Valley Trust Company, St. Louis. Newman, Saunders & Company are the agents appointed by the committee to assist in carrying out the plan. The firm will establish offices in St. Louis.

Suit has been filed by attorneys for bondholders of the St. Louis & Suburban Railway asking for the appointment of a separate receiver and a separate valuation by the Missouri Public Service Commission. The decision to bring suit is said to have grown out of dissatisfaction by representatives of the bondholders with the terms proposed to be extended to them for participation in the reorganization of the system.

Foreclosure action under a mortgage securing $2,000,000 of the Suburban bonds is now pending in the federal court. These bonds are secured mainly by the downtown loop of the Hodiamont division. An additional issue of Suburban bonds is also in default, but foreclosure proceedings have not been instituted.

The United Railways and Receiver Wells have denied the allegations set forth in the new Suburban petition. The answer of the attorneys for the United Railways specifically denied that the Hodiamont division of the Suburban owned the downtown loop.

City Counselor Senti of St. Louis has announced that the city will oppose all attempts to separate the two systems. The city's petition will be oral.

## Indiana Interurban Suffers Loss of $179,824 in 1923

The Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., shows in its annual report for 1923, filed with the Public Service Commission, that it had a deficit in gross income of $11,500. In other words, operating expenses, taxes and depreciation amounted to more than revenues. The deficit for the year was $179,824, after charging interest on debt and an amortization item against gross income.

Passenger revenue for the year was $369,623, or $41,806 less than for 1922. Total operating revenues were $583,859, or $43,903 less than for 1922. Operating expenses were cut down $21,905 as compared with 1922, the operating expenses for 1923 being $562,403. Operating revenues were $21,456 more than operating expenses, including depreciation. Taxes were $34,437. This resulted in a loss in operating income of $12,981. The non-operating income was $1,481.

The report shows that $119,950 interest on bonds accrued during the year and that $45,275 interest on bonds was paid.

## Economist Testifies on Values

### Johns Hopkins Expert, in Buffalo Case, Sees Continuation of Present Price Level for Five Years

Testimony on behalf of the International Railway, Buffalo, N. Y., in the valuation case was given by Dr. Jacob H. Hollander, professor of political economy in Johns Hopkins University, before the Public Service Commission of New York on March 25. Dr. Hollander's testimony dealt with the factors affecting the general price level and the probable future price level. In his testimony Dr. Hollander stated that there were two possible ways of discussing the probable trend of prices during the next five years. One he described as "Historical Parallel" and the other "The Method of Analyzing as to Cause."

### HISTORICAL PARALLEL METHOD FALLACIOUS

With respect to the method of "Historical Parallel," Dr. Hollander stated that the defect in it is that the historical parallel is meaningless unless it can be established that the same conditions operated or will operate in each successive case. He contrasted the situation after the War of 1812 and after the Civil War with the situation after the World War, pointing out that the two powerful causes for the decrease in prices after the two previous wars had been the return to a gold standard and the scarcity of gold, neither of which causes was present after the World War, as the United States had always maintained specie payments and the country was not threatened with a gold famine, but with a gold plethora. The historical analogy, the doctor stated, fails not only in that the causes which operated after the two early wars are not present after this war, but exactly the converse obtains.

In continuing his testimony, the doctor stated that the tendency, therefore, is to discredit the historical analogy method and turn to the other, or analytical method, which is practically ascertaining what factors influence prices and what may be expected as to those factors.

Dr. Hollander stated the two factors that influence prices are the amount of goods and the amount of money. By means of graphic charts the doctor demonstrated that the industry of the country is operating on a scale unparalleled in our national history and that the basic industries of the country are exceeding the war peak in their volume of production. From this he concluded that if there should be any drop in prices it will not be because of enormous increase in the volume of production.

With respect to any change in the volume of money, money in the business sense meaning the volume of credit, the doctor after explaining charts showing the position of the Federal Reserve system and explaining the Federal Reserve ratio had increased from 40 per cent in 1920 to 80 per cent at the present time, stated that the country was in a situation in which it was practically deluged with gold, and the possibility of utilizing that increased gold structure for the expansion of credit is so apparent that it makes conservative banking a good deal of a resistance to popular demand from those classes of the community who call for rising prices.

The analytical method, the doctor explained, proceeds on the theory that opinion as to the course of prices is simply trivial unless it is based upon the conclusion drawn from the forces which determine prices. These forces are the volume of trade and the amount of credit. As to the volume of trade, affairs have reached the point where maximum production is in sight. As to the volume of currency, matters are in the position where banking policy and conservative administration are called into play to prevent that expansion which would be the natural consequence of an accumulation of gold. It is a reasonable conclusion, confirmed by the developments of the last year, that banking policy, in so far as it is subject to control, will be in the direction of encouraging price stability and that a period of five years may be expected in which prices are likely to hover approximately around 150, where they have been for the last twelve months.

In reply to the question, "Is the use of the historical analogy for predicting future prices based on anything more than supposition?" the doctor stated:

> I think it is not entitled even to be described as supposition. It enjoys no recommendation whatsoever, anything more than it would be to say that because two things look alike, therefore they are alike. To base a conclusion as to what will happen after the third peak upon what happened after the two earlier peaks, without ascertaining whether like conditions prevail, is certainly an uncharted flight into the realms of fancy.

## Receiver Appointed for Isle of Palms Company

Perroneau R. Rivers, Charleston, S. C., has been appointed receiver of the Charleston Isle of Palms Traction Company, by order of Judge H. A. M. Smith, in federal court upon petition of the Baltimore Trust Company, Baltimore, Md., trustee under the indenture securing $250,000 of 5 per cent bonds. The sheriff of Charleston County, on Feb. 21, seized the ferryboats and cars of the company, under attachment proceedings. He was ordered to show cause why he should not be restrained from proceeding to advertise and sell that portion of the property which he seized.

No resumption of operations of ferry and car service is contemplated. Meanwhile a public ferry and bridge service has been provided for in a bill passed by the General Assembly to take the place of service formerly run by the company.

The company was incorporated under the laws of South Carolina on Jan. 9, 1913. It took over the Seashore Division of the Charleston Consolidated Railway & Lighting Company, a line of 10 miles, extending from Mount Pleasant to Sullivan's Island and Isle of Palms, with its equipment and powerhouse on Sullivan's Island. Mount Pleasant and Charleston are connected by ferry by the company by means of two ferryboats.

## Kansas Merger Completed

The Topeka Railway & Light Company, Topeka, Kan., has changed its name to the Kansas Public Service Company and taken title to the property of the Atchison Railway, Light & Power Company and the Wichita Railway & Light Company. It will, as formerly, own all the stock of the Topeka Edison Company and the Topeka Railway, and in addition purchase all the common stock of the Kansas Power & Light Company.

New companies have been formed to be known as the Kansas Public Service Company and the Kansas Power & Light Company. Their formation was effected around the Topeka Railway & Light Company, which was the holding company and owned all the stock of the Topeka Edison Company and the Topeka Railway. The Illinois Power & Light Corporation owned all of the stock of the Topeka Railway & Light Company, also the Atchison Railway, Light & Power Company and the Wichita Railway & Light Company.

The Kansas Power & Light Company has been formed primarily to build a new power plant at Tecumseh and transmission lines in Kansas, among them the line from Topeka to Atchison.

Officers of the Kansas Public Service Company are: Clement Studebaker, Jr., president; William A. Baehr, H. L. Hanley, vice-presidents; Scott Brown, vice-president and secretary; George M. Mattis, treasurer, and Edward Woodman, clerk.

Brief mention of the intended merger was made in the ELECTRIC RAILWAY JOURNAL for March 22, page 484.

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**Auction Sales in New York.**—At the public auction rooms of A. H. Muller & Sons there were no sales of electric railway securities this week.

**Prior Preference Stock Offered.**—A new issue of $7,500,000 Standard Gas & Electric Company, Chicago, Ill., 7 per cent prior preference stock is being offered by H. M. Byllesby & Company, Janney & Company, Hambleton & Company and the Federal Securities Corporation. The stock is priced at 93½, to yield approximately 7.50 per cent. The new financing is part of the plan to retire secured funded debt.

**Reorganization Agreement Reached.**—The committee representing the refunding 5 per cent, thirty-year gold bonds of the Buffalo & Lake Erie Traction Company, Erie, Pa., amounting to $7,066,000, notified the holders of these bonds and deposit certificates recently that a plan and agreement for the reorganization of the company have been reached. Alvin W. Krech is chairman of the committee.

**Gold Debentures Offered.**—A syndicate including Halsey Stuart & Company is offering at 99 and interest, yielding 6⅞ per cent, $3,500,000 of the West Penn Railways three-year 6½ per cent gold debentures due April 1, 1927. The railway part of the West Penn system, largely interurban, is located in the Pittsburgh industrial district of southwestern Pennsylvania and in West Virginia.

**Stock Issue Approved.**—The Public Utilities Commission has authorized the Central Maine Power Company, Rockland, Me., to issue and sell at not less than par 2,310 shares of its 7 per cent preferred capital stock of the par value of $100 each. The proceeds of the sale are to be used to reimburse its treasury and discharge indebtedness incurred by its payment of the sum of $231,000 for the retirement of 2,310 shares of the preferred stock of the Androscoggin Corporation.

**Attempts to Keep Line Operating Fail.** — Several attempts have been made, since the Connecticut Valley Street Railway shut down, to keep the line in operation between Northampton and Hatfield, Mass., but all efforts have failed. It is said that the road between Northampton and Amherst may be purchased by the Northampton Street Railway.

**Bonds Offered to Yield 5.75 per Cent.**—The Paine-Webber Company, New York, and R. L. Day & Company, Boston, are offering for subscription at 102 and accrued interest to yield 5.75 per cent $550,000 of Holyoke Street Railway first mortgage 6 per cent gold bonds dated April 1, 1915, and due April 1, 1935. It is explained that since 1919 net earnings prior to depreciation in each year have been more than three times the interest requirments on the entire funded debt, including this issue. During this period the amount charged to maintenance and depreciation in each year has been more than 23 per cent of the total revenue. Dividends are being paid at the rate of 6 per cent per annum on the capital stock.

**Railway Buys Light Company.**—The Indiana Public Service Commission has approved the sale of the Geneva Light & Power Company to the Marion & Bluffton Traction Company. The purchase price is $65,000, of which $50,000 is payable in cash and the remaining $15,000 in bonds of the Bluffton-Marion line. The property just purchased furnishes light and power to Vera Cruz, Craigville, Linn Grove, Berne and Geneva in Indiana and Chattanooga, Ohio.

**Want to Issue Bonds for Improvements.**—The Columbus Railway, Power & Light Company, Columbus, Ohio, has filed an application with the State Utilities Commission for authority to issue $2,250,000 in bonds, the proceeds to be used to reimburse the company for capital expenditures for further extensions and improvements. The application cites that between Oct. 1, 1921, and Feb. 29, 1924, the company paid out of its treasury a total of $4,750,565, none of the amount covered by the issuance of bonds, stocks, notes or other indebtedness securities. The railway department benefited in the expenditures to the extent of $1,571,545, while $1,501,336 went to the power, light and heat department for transmission, storage and distribution equipment. Land, structures and equipment consumed the remainder of the amount, it is shown.

**Preferred Stock Offered.**—A syndicate including A. E. Fitkin & Company, New York, is offering $1,250,000 of the Jersey Central Power & Light Corporation's 7 per cent cumulative participating preferred stock at 92½ per share and accrued dividends to yield more than 7½ per cent. The proceeds from the present financing will be used to acquire the stock of the Consolidated Gas Company of New Jersey and the Tri-County Electric Company and the balance for other corporate purposes, including additions and betterments to the properties. In addition to its operations in New Jersey the Jersey Central Power & Light Corporation controls the Tide Water Power Company, which owns and operates the entire electric light and power, gas and electric railway business in Wilmington, N. C., and suburbs and other light and power properties in Florida.

**Local Service Abandoned in Temple.**—Street car service in Temple, Tex., which has been maintained for the last nineteen years by the Belton-Temple Traction Company, has been practically abandoned since the new owners took over the interurban line between Belton and Temple. Service has been abandoned altogether in the northern part of the city, and the line serving South Temple has been shortened and several cars taken off. It was said by the new owners that the local service was a losing proposition and that it could not be maintained. The City Commissioners assented to the abandonment of the service. Tracks of the abandoned lines are being taken up.

**Accumulated Deficit $326,270.**—The Sacramento Northern Railroad, operating in Sacramento, Chico, Colusa, Woodland and vicinity, reports to the California Railroad Commission for the year 1923 that its operating revenue was $1,592,247; operating expenses $1,361,466, giving a net operating revenue of $230,781. Interest, rent, taxes and other deductions totaled $344,484. The corporate loss for the year was $79,561. The deficit at the beginning of the year amounted to $203,420. Miscellaneous additions to surplus for 1923 amounted to $4,587 and miscellaneous deductions were $47,876, leaving an accumulated deficit at the end of the year of $326,270.

**New York City Tractions Offer Investment Opportunities.**—William Carnegie Ewen, who has specialized for many years in New York City traction securities, has prepared a frank discussion and a general forecast of the local situation which he calls: "What's Ahead for the New York Tractions." He discussed the present political situation and reviews briefly the terms of the existing rapid transit contracts and then concludes: "Viewed from every angle, only one conclusion may be drawn—that the traction companies are on the eve of a period of great prosperity. As time goes on, their strong strategic position will be realized more and more by investors, and as a result we look forward with confidence to a steady appreciation in the value of those traction issues which have an adequate degree of security behind them."

**Must Pay Increased Taxes.** — The New Jersey Supreme Court has handed down an opinion in the franchise tax case of the city of Phillipsburg, N. J., against the Phillipsburg Transit Company, affirming the contention of the town. This means that the transit company will have to pay increased franchise taxes. In February, 1922, the city complained to the State Tax Board that the return of gross receipts made by the transit company was incomplete and did not show all of the gross receipts. The city wanted a return for the assessment of the franchise tax, based on the gross receipts from passengers carried in New Jersey and also in Easton, Pa. It is said that fares collected in Pennsylvania were not reported. The state board entered judgment and the Supreme Court upholds the decision.

**Unusual Pamphlet Tells Earnings Story.**—For the year ended Dec. 31, 1923, the Middle West Utilities Company, Chicago, Ill., a holding company for more than twenty subsidiary companies on which several hundred communities are dependent, reports a net income of $2,742,706. The surplus as of Dec. 31, 1923, was $2,064,417. These facts are contained in the annual report, which is an unusual pamphlet from the point of view of picture display and interesting data contained in its pages. Besides explaining the status of the physical properties involved the booklet describes in detail the company's activities during the year just ended in the matter of customer ownership, employees' life insurance and public relations. Some instructive charts accompany the story of accomplishment. Many scenes depicting the company's doings in the various states it serves are reproduced. To show the plants geographically a map is included locating the various properties.

# Legal Notes

FEDERAL COURTS—*Taxation of Property of Street Railways as Personal Property Held Legal.*

In 1919 the State tax commissioner of Washington, acting under a state law, assessed a street railway property as "personal property." As so much of the property consists of cars, tracks, poles, appliances, wires and power houses, such an assessment was upheld as legal. [Puget Sound Power & Light Co. vs. King County, 44 Sup. Ct., 261.]

CALIFORNIA—*Pedestrian Injured While Walking Around Dirt Pile Wrongfully on Street.*

A water company, in violation of ordinance, piled dirt on the street less than a foot from the car track, so that a person crossing the street had either to climb over the pile or skirt it along the track. While doing the latter in the dusk of the evening, a pedestrian was hit by a car. It was held that both water and railway company were negligent. [Hansen vs. Market Street Railway, 221 Pacific Rep., 955.]

INDIANA—*Duty to Keep Depot and Platforms Safe Not Extended to Premises Not Adapted to Invitee's Business.*

The ticket agent at a station was in the basement when a person stopped to buy a ticket and check his baggage. Not finding the agent, he walked out to the freight platform and fell off a point that was unguarded. The company was held not responsible. [Union Traction Co. of Indiana vs. Grohs, 142 Northeast Rep., 389.]

KANSAS—*Purchaser of Street Railway at Receiver's Sale Takes Property Subject to Franchise Liabilities as to Paving.*

A person who becomes the assignee of a purchaser at a receiver's sale of the property and franchise of a street railway company takes the property and franchise subject to all the terms and conditions imposed by the franchise, including the obligation to pave certain portions of the streets. Hence, a sheriff, under a tax warrant issued by the county treasurer to collect this tax, may sell any non-exempt property of the person or corporation holding the franchise. [Fort Scott Public Utilities Co. vs. Sheriff et al., 222 Pacific Rep., 93.]

MASSACHUSETTS — *Persons Stepping from Automobiles Must Use Care.*

In order to allow a guest riding in an automobile to get out and take the trolley, an automobile was stopped suddenly on the track just beyond a white pole. The automobile driver expected the car would stop at the pole, but it did not and struck the automobile, injuring the person alighting. The court held that in these circumstances the person injured was guilty of contributory negligence. [Will vs. Boston Elevated Railway, 142 Northeast Rep., 44.]

MICHIGAN—*Words "Public Convenience and Necessity," as Applied to Motor Vehicles, Include Them Only.*

This case arose through a writ of certiorari by the Rapid Railway Company against the Michigan Public Utilities Commission to review an order granting a permit to the Wolverine Transit Company to operate a bus business between Detroit and Mount Clemens. The act under which the commission granted this permit declares that bus permits must be obtained from the commission and "said permit shall be issued in accordance with the public convenience and necessity." The majority of the commission held that the language of this section limited the inquiry to "whether a public convenience and necessity exists as to the motor vehicle business," but the Rapid Railway Company contended that all means of transportation between the points to be served must be considered. The court held, however, that this is not the case, partly because there is no reference in the act to indicate the Legislature had in mind the protection of existing railroad transportation interests, partly because the history of the bill in its passage does not indicate any such intention and partly because the purpose of the bill as declared in its title was to regulate the use of motor vehicles on the highways. [Rapid Ry. et al. vs. Michigan Public Utilities Commission, 196 N. W. Rep., 518.]

NEW YORK—*Consent of City Held to Embrace Consent to Spur in Front of Lots.*

Where a franchise is given to operate a railroad on certain streets, and it is reasonably necessary to construct a spur on an intersecting street in order to connect with a carhouse, it may be so laid if no suitable site for the carhouse can be found along the route. [Westchester Electric Railway vs. City of Mount Vernon et al., 142 Northeast Rep., 585.]

NEW YORK—*Lease and Modification, When Approved by Two-thirds of Stock, Held Binding.*

Under Railroad Law, Sec. 148, a railroad is authorized to lease its property, and this lease becomes binding when approved by the owners of two-thirds of the stock of each corporation. Though the statute is silent as to how such a lease may be modified, it is a fair implication that it may be modified in the same manner. Hence, a provision of a railroad lease that the lessee's guaranty of 7 per cent dividends as rent to lessor's stockholders could not be reduced without the unanimous consent of lessor's stockholders was held to be illegal, as attempting to set up a different agency for the modification of such lease than that established by the law, as mentioned above, and the guaranty did not survive a valid modification of the lease, made as outlined above. [Peabody vs. Interborough Rapid Transit Co., 202 New York Sup. (Sup. Ct.), 287.]

OKLAHOMA—*Injury to Leaving Passenger from Car Overhang on Curve.*

When a passenger is discharged from a street car at a regular stopping point, he should have a reasonable opportunity to get beyond danger from the movement of the car. The railway company is not bound to warn a pedestrian that he may be struck by the overhang on a car in rounding a curve, since that is a matter of common knowledge, but if the pedestrian is a passenger who has just left the car, the condition is different. [Trail vs. Tulsa Street Railway, 222 Pacific Rep., 950.]

WISCONSIN—*Commission May Permit Operation of One-Man Cars, Notwithstanding Municipal Ordinance.*

This was an action brought by the city of Milwaukee to set aside an order of the Railroad Commission authorizing the Milwaukee Northern Railway to install one-man cars in its local street railway in Milwaukee. The city of Milwaukee had passed an ordinance requiring all street cars to have a crew of not less than two men. The court held that as the Legislature was the creator of municipal powers, its authority was supreme in such matters, and that it had properly authorized the commission to exercise the power to investigate and decide what constitutes reasonable and adequate service. [City of Milwaukee vs. Railroad Commission of Wisconsin, 196 N. W. Rep., 853.]

# Personal Items

## Mr. Harvey Promoted

### Assistant Manager of Toronto Transportation Commission Appointed to Succeed Mr. Couzens

D. W. Harvey has been appointed general manager of the Toronto Transportation Commission, operating more than 200 miles of electric railway formerly included in the system of the Toronto Railway, privately owned, and the Toronto Civic Railway. In that capacity he succeeds H. H. Couzens, who, as noted in the ELECTRIC RAILWAY JOURNAL for April 5, has joined the forces of the Brazilian Traction, Light & Power Company. He has been assistant manager at Toronto.

D. W. Harvey

Mr. Harvey is not a difficult man to interview, but it is indeed very difficult to elicit any information from him about himself. Talk Toronto railways and he is at home. Hint at Harvey as a personage and he is silent. He can see nothing in his own life that should interest others. This is not mock modesty. The distressing thing about it is that Mr. Harvey is sincere in the humility which he shows toward the merits of his own accomplishments.

As Mr. Harvey sees it, to borrow from Elmer Rice, his life has been free from marches and counter marches and any victory on a stupendous scale. About this judgment his associates disagree with him. They are reticent, however, because he is so modest about himself. They know it would be distasteful to him to sing his praises, but they insist upon the value of the performance of the man along the line of permanent, public accomplishments. Not the least of these is the ability—amounting at times almost to genius—which he displays in getting along with other men.

The man has many other merits. Because he had built solidly while with the old Civic Railway at Toronto, Mr. Harvey was made assistant to Mr. Couzens in the fall of 1921, when the lines of the Toronto Railway were taken over by the commission, and for similar reasons he has now been selected to succeed Mr. Couzens. It was logical that he should be. To them fell the task of rehabilitating the local Toronto lines, and the success they have attained—and it is real, definite success—is due in no small measure to the fact that they were permitted to work out the details in their own way and without political interference.

Mr. Harvey knows Toronto thoroughly. He knows its transportation needs. He really began to visualize them as long ago as 1911, when the first of the so-called civic lines was placed in operation. Of that line he was construction engineer. In 1912 the operation and maintenance were placed under his supervision, and in these capacities he continued until appointed to be assistant manager of the Toronto system in 1921, after the lines of the Toronto Railway had been acquired by the city. Mr. Harvey was born in London, Ont., on Feb. 24, 1887. He was graduated from Toronto University, and before entering railway work he was with the Ontario Power Company and the Toronto Structural Steel Company.

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## L. H. Palmer and S. E. Emmons Advanced at Baltimore

L. H. Palmer has been elected vice-president of the United Railways & Electric Company, Baltimore, Md., in addition to general manager, and S. E. Emmons has been appointed to the position of assistant general manager.

"Lou" Palmer, as he is familiarly known to his associates, has been general manager of the company since last March. At that time he succeeded in that position Herbert B. Flowers, who resigned to become president of the New Orleans Public Service, Inc. Before that Mr. Palmer had been assistant to the president at Baltimore since October, 1917.

Mr. Palmer is one of the best known men in the transportation side of the industry. He has been particularly active in association work. He was born in Chicago, but his business life has been spent in the East. He was graduated from Williams College in 1902, and then served with both the New York Central Railroad and the old Metropolitan Street Railway, New York. He has been connected with the company at Baltimore since 1915.

Mr. Emmons has been serving for the past two years as assistant to the general manager both under H. B. Flowers and his successor, Mr. Palmer. Previous to that Mr. Emmons had been in steam railway work. He came to the Baltimore company from the position of assistant chief engineer of the Ann Arbor Railroad. He had also served with the Pennsylvania Railroad and the Santa Fé. He was connected with H. E. Riggs on the Toledo valuation.

He was graduated from the University of Michigan, Engineering Department, and during the war was a captain of engineers in overseas service. Mr. Emmons is twenty-nine years old. He is a son of C. D. Emmons, president of the company.

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## Mr. Boylan Made Manager in New Jersey

M. R. Boylan, acting general manager of the Public Service Railway, Newark, N. J., since last December, has been elected vice-president and general manager. In that capacity he succeeds R. E. Danforth, recently resigned.

M. R. Boylan

Mr. Boylan really established his reputation with the Public Service Corporation as an accountant. As such he has an uncanny capacity for digging quickly to the root of things. This ability he is said to have turned to extraordinary account since he has been handling railway matters, with the result that he has already established for himself a reputation in his conduct of the affairs of the railway both with respect to the economies that he has been able to work and in the direction of carrying out promptly policies decided upon by him for adoption.

In short, Mr. Boylan has brought to the problems confronting the railway a new and detached point of view, but one that embodies an intimate knowledge of the history of the railway and a keen understanding of the point of view of the public. Mr. Boylan has been with the company since 1892. He is a native of New Jersey. His career was reviewed at length in the ELECTRIC RAILWAY JOURNAL for Dec. 1, 1923.

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## President Finlay Resigns from Montreal Company

William C. Finlay, president of the Montreal Tramways & Power Company, Ltd., Montreal, Que., and three fellow directors have resigned. The retiring directors are J. M. Wilson, George G. Foster and J. K. MacIntyre. Their departure leaves the board in full control of new officers elected at the last annual meeting.

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C. N. Wilcoxon, president and general manager Chicago, Lake Shore & South Bend Railway, Michigan City, Ind., has resigned.

# Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

## Philadelphia Company Buys American Locomotive Plant

Announcement was made recently by Arthur W. Thompson, president of the Philadelphia Company, of the purchase of the property and buildings of the American Locomotive Company in Preble and Island Avenues, Northside, Pittsburgh, locally known as Manchester. The price involved was $1,500,000. More than 11 acres are involved in the purchase, six of which are covered with brick and steel buildings of modern construction. The site adjoins the present Manchester carhouse and shops of the Pittsburgh Railways.

The property was acquired for the purpose of consolidating the storehouses of the various public utility properties of the Philadelphia Company, including railway, light, power and gas companies. The Manchester site will be the general storehouse of all these companies, and the office building on Preble Avenue formerly occupied by the administrative forces of the American Locomotive Company, will serve as the headquarters of the general storekeeper, who will operate under the supervision of the general purchasing agent of the Philadelphia Company and affiliated corporations.

## New Import and Export Records Made in 1923

New records were made in 1923 in both the country's export and import trade, according to an analysis of American world trade made by the Foreign Commerce Department of the United States Chamber of Commerce.

Statistics of the quantity of logs and timber exported were made available first in 1912, when 664,000,000 b.ft. were exported, the record until the 1923 shipments of 752,000,000 b.ft.

Import records also were broken in 1923, principally in raw materials and partly manufactured goods for domestic industries. Crude rubber imports of 692,000,000 lb. in 1923 were 18,000,000 lb. larger than the 1922 receipts. The 1913 receipts of iron ore—2,595,000 tons—fell far below the 1923 imports of 2,768,000 tons. Imports last year of nearly 2,000,000,000 b.ft. of lumber were 400,000,000 b.ft. greater than in 1922.

For the first time since 1919 exports from the United States show an increase to every continent of the world. Every one of the country's ten leading customers bettered its 1922 purchases. These ten leaders, Great Britain, Canada, Germany, France, Japan, Cuba, Italy, Mexico, Australia and Argentina, take about 75 per cent of the total exports. A few important markets show smaller purchases. The declines in shipments to Belgium and India were so small as to be neglible. Practically all of the country's chief suppliers shipped the United States more goods in 1923 than in 1922, the only leaders showing declines being Japan and Switzerland.

## Washington Is Hopeful

### Prospects Ahead Brightened by Report of Commission of Experts—Situation at Home Is Good

Official circles in Washington see as the brightest spot in the economic sky the prospect for the solution of some of the European difficulties along the lines which are being suggested by the commission of experts. With a favorable turn in European affairs in immediate prospect, strong support for the wheat market is likely to develop. Since the stocks of all commodities in Europe have been held at a minimum, better prospects there would be reflected in the demand for American goods. While the immediate effect would be stimulating to the American market generally, the advance of stabilizing influences in Europe eventually will mean keener competition for foreign markets.

Domestically, industrial prosperity continues to rest on the super-activity of the construction industry. It is the balance wheel which is keeping things going. The public is demanding more room. The building program is going to be more extended than had been estimated. There is every evidence that it will be particularly active throughout 1924 and take up any slack in employment. It is the agricultural industry which is holding things back. A scrutiny of the index figures covering agricultural prices, however, indicates that it is coming closer and closer to the index numbers covering other commodities. Prices of manufactured goods are diminishing gradually as those of agricultural products are gradually rising.

Business as yet appears to be unaffected by the epidemic of investigations which are in progress on Capitol Hill. If there is indefinite continuation, however, of the furnishing of great pulpits from which the underworld is to be allowed to pour its vituperation, it is regarded as entirely within the range of possibility to undermine confidence to the extent that business will receive a jar. Thus far, however, it seems that the inherent sanity of the American people is standing them in good stead and they are not being carried off their feet. The government employs 600,000 persons in its service. Despite all the safeguards which are provided, it is humanly impossible to guarantee the probity of each one of the 600,000. Evidence taken in executive session is the buffer which stands between the community and those accused in the malicious statements. There is no thought, however, in the statements here set down of belittling the importance of certain disclosures which have grown out of the congressional investigations.

## Metal, Coal and Material Prices

| **Metals—New York** | April 8, 1924 |
|---|---|
| Copper, electrolytic, cents per lb. | 13.437 |
| Copper wire base, cents per lb. | 15.875 |
| Lead, cents per lb. | 8.60 |
| Zinc, cents per lb. | 6.575 |
| Tin, Straits, cents per lb. | 51.25 |
| **Bituminous Coal, f.o.b. Mines** | |
| Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons | $4.20 |
| Somerset mine run, Boston, net tons | 2.125 |
| Pittsburgh mine run, Pittsburgh, net tons. | 1.875 |
| Franklin, Ill., screenings, Chicago, net tons | 2.175 |
| Central, Ill,, screenings, Chicago, net tons. | 1.675 |
| Kansas screenings, Kansas City, net tons. | 2.50 |
| **Materials** | |
| Rubber-covered wire, N. Y., No. 14, per 1,000 ft. | $6.65 |
| Weatherproof wire base, N.Y., cents per lb. | 17.50 |
| Cement, Chicago net prices, without bags. | $2.20 |
| Linseed oil (5-bbl. lots) N. Y., per gal. | $0.93 |
| White lead, in oil (100-lb. keg), N. Y., cents per lb., carload lots | 12.25 |
| Turpentine, (bbl. lots), N. Y., per gal. | $1.00 |

## New Shops for Columbia Machine Works Are Progressing

Rapid progress is being made in the rebuilding of the shops of the Columbia Machine Works, Brooklyn, N. Y., which were recently destroyed by fire. A building of reinforced concrete, steel and brick is being erected which is 500 ft. long and 75 ft. wide. Part of this building is two stories and the south end one story high. The new structure extends along Chestnut Street, from Atlantic Avenue to Fulton Street, and will provide facilities for the blacksmith shop, machine shop and brass foundry.

At present work is being carried on in the buildings which were not damaged by fire, and while these facilities are sufficient to handle present orders, they are inadequate to meet the increasing demand for the company's products. The new shops will be equipped with the latest type of machine tools, which will assist in speeding up production and shorten delivery time. Five or six overhead traveling cranes will be provided in the new building. A 10-ton yard crane is now being erected for handling material in the yard and for loading and unloading cars. Part of the new building will be ready for occupancy in June, but it will require nearly a year to complete the entire work.

## Chicago Surface Lines Seeks Bids for 100 Cars

Inquiries are being sent out by the Chicago Surface Lines for bids on the construction of 100 new double-truck arch-roof motor cars. They are to be equipped with two 65-hp. motors each and multiple-unit double-end control for operation as single cars or in trains. The doors on both sides of each vestibule will be pneumatically operated and arranged so that quick loading and unloading can be accomplished in street or subway operation. In either direction of operation the rear doors may be controlled by an operator on either platform or by a street collector. The exit door at each end will be of the new automatic type which was used on a group of forty-five one-man cars described in the ELECTRIC RAILWAY JOURNAL of Sept. 30, 1922.

The specifications are as follow:

| | |
|---|---|
| Number of cars | 100 |
| Name of road | Chicago Surface Lines |
| Type of car | Multiple-unit, double-end |
| Total weight | 38,000 lb. |
| Bolster centers, length | 22 ft. 0 in. |
| Length over all | 48 ft. 11 in. |
| Truck wheelbase | 4 ft. 10 in. |
| Width over all | 8 ft. 6 in. |
| Height, rail to trolley base | 11 ft. 6 in. |
| Body | Semi-steel |
| Interior trim | Cherry |
| Headlining | ¼-in. Agasote or $\frac{3}{16}$-in. plywood |
| Roof | Arch, ¼-in. plywood |
| Air brakes | Straight air with emergency feature |
| Signal bells and buzzers | Consolidated, or equal |
| Car trimmings | Bronze, statuary finish |
| Center and side bearings | Railway standard, plain |
| Conduits | Duratube or equal, and aluminum |
| Control | Multiple unit |
| Couplers | Automatic, with air jumpers for electric circuits |
| Curtain fixtures | Rex roller, fixtures to be approved |
| Curtain material | Double face |
| Destination signs | Hunter illuminated or equal |
| Door operating mechanism | National Pneumatic or equal with automatic exits |
| Wheelguards | H. B. |
| Hand brakes | Pittsburgh No. 35 or equal |
| Hand straps | Rico No. 7 |
| Heater equipment | Consolidated cross seat or equal |
| Headlights | Railway standard pressed steel |
| Lightning arresters | M. D. or equal |
| Meters | Economy |
| Motors | 2-65 hp. outside hung |
| Paint, varnish or enamel | Chicago varnish and Vitrolite enamel |
| Rails and stanchions | Aluminum |
| Registers | International R-7 or equal |
| Roofing Material | No. 8 National prepared roofing |
| Sanders | Electric Service No. 135-A or equal |
| Sash fixtures | O. M. Edwards or equal |
| Seats | Rattan full spring upholstered |
| Step treads | Kass or equal |
| Thermostat | Ry. Utility or equal |
| Trolley catchers | Ohio Brass or equal |
| Trolley base | U. S. 14 or equal |
| Trolley wheels | Railway standard |
| Trucks | Maximum traction |
| Ventilators | Railway Utility or equal |
| Wheels | Rolled Steel, 28 in. |

## Belgian Concern Active in Building Motors

The progress of the Ateliers de Constructions Electriques de Charleroi, Belgium, gives a striking illustration of the industrial recovery of Belgium. From a pre-war force of 800 men and 510 machine tools, this Charleroi manufacturing shop has increased to a personnel of 4,100 and 2,000 machine tools.

Among its various manufactures is a line of traction motors which constitute an important department of the concern. Subsequent to the war motors of 25 hp. at 500 volts have been manufactured, and more recently a 30 hp. size. As a matter of fact, Charleroi works as early as 1900 built a complete series of motors ranging from 20 to 225 hp., for a gage of 1,435 meters.

With the growth of tramway services and the general reduction of the gage to 1,000 meters, the Charleroi works developed a new series of motors more compact in design and comprising 50 hp. motors at 700 volts, equipped with four commutator poles. This type of motor now competes actively in Europe with American built motors.

The company is now engaged in developing a new series of motors with forced ventilation, with the idea of securing maximum power with minimum space and weight. All air holes are to be supplied with protecting screens against water and dust, which, it is said, can be so arranged as to give all the effect of an armored motor.

## *Rolling Stock*

**Pittsburgh Railways, Pittsburgh, Pa.,** has placed an order for 200 new cars.

**Madison Railways, Madison, Wis.,** will purchase seven or eight new cars if the recommendations of the Wisconsin Railroad Commission are carried out.

**New Orleans Public Service, Inc., New Orleans, La.,** will soon ask for bids on fifty-five cars.

## *Track and Line*

**Spokane United Railways, Spokane, Wash.,** will rebuild tracks on Riverside Avenue, between Lincoln Street and the Monoghan monument, with new rails and ties, set in solid concrete. The double curve that now exists will be removed and one long curve installed.

**Kansas City Railways, Kansas City, Mo.,** has applied to Judge Stone for permission to extend its line on South Prospect Avenue to Fairyland Park and to rebuild various stretches of track at an expenditure of $500,000.

**Wichita Railroad & Light Company, Wichita, Kansas,** plans to extend the College Hill division from Roosevelt to Belmont, a distance of five blocks. Howard Patten, general manager, has estimated the cost of this improvement at $18,000. Construction of the extension will start soon.

**New York, N. Y.**—Contractors' bids for the construction of the main stem of the crosstown subway in Brooklyn, in Bedford Avenue from DeKalb Avenue to Keap Street, will be received by the Transit Commission on April 25. The commission unanimously selected April 25, on motion of Commissioner Harkness that the construction work be proceeded with forthwith. This will be the first of the construction contracts for the new lines, but the commission has already submitted to the Board of Estimate proposals for the making of test borings along Bedford Avenue and for the removal of the memorial trees along that thoroughfare.

**Seattle Municipal Railway, Seattle, Wash.,** has started on its summer construction program, involving an expenditure of nearly $750,000, under supervision of A. E. Pierce, superintendent of maintenance. An order for 600 tons of heavy steel trackage, costing $420,000, has been placed by Mr. Pierce. The work involves renewal of special trackage at Second Avenue and Pike Streets; new cable crossings and foundations, costing $30,000, at Third Avenue and James Street, and Third Avenue and Madison Street. These jobs call for replacing present crossings, excavation of concrete bed, and building up steel and concrete foundation work 26 ft. square and 39 in. deep below the track level. Track renewals in various parts of the city, paving of three spur tracks and surface reconstruction and repaving between tracks complete the work. The largest single job will be the retracking of Westlake Avenue from Roy Street to the Fremont bridge, to cost $100,000.

**The Nashville Railway & Light Company, Nashville, Tenn.,** will spend more than $600,000 in 1924 on its construction program. It is proposed to rebuild 12.58 miles of track, which it is estimated will cost $280,000.

## *Power Houses, Shops and Buildings*

**New Orleans Public Service, Inc., New Orleans, La.,** expects during the next month and a half to have the 20,000-kw. generator for the Market Street power station and three months after arrival it is expected to be in operation. The generator, condenser, switchboard and other appliances will cost $1,200,000.

**Manchester Traction, Light & Power Company, Manchester, N. H.,** has awarded a contract to Stone & Webster, Inc., Boston, Mass., for the installation of vertical hydraulic turbine units of 2,400 and 3,200-kw. rating at its Garvins Falls station on the Merrimac River and of a vertical unit of 1,000-kw. rating at Kelly's Falls, on the Piscataquog River. The Kelly's Falls plant will be equipped with full automatic control, with additional provision for supervisory control from the company's adjacent steam plant.

## *Trade Notes*

**H. E. Pratt,** formerly vice-president of Babcock & Wilcox Company, New York, N. Y., has been elected president of the company, succeeding W. B. Hoxie, who becomes vice-chairman. E. H. Wells remains chairman. Isaac Harter, general superintendent, succeeds Mr. Pratt as vice-president.

**Quigley Furnace Specialties Company, New York, N. Y.,** will move its Chicago office to larger quarters, on May 1, at 9 South Clinton Street.

**Industrial-Utilities Service Bureau** is now located in Suite 509, M. E. Taylor Building, Louisville, Ky.

**White Company, Cleveland, Ohio,** has received word that the last shipment of thirty White Model 20 buses, completing an order of sixty, has reached Tokyo, Japan, to go into the service of the Tokyo Bus Company. The Tokyo Bus Company, with the addition of the sixty new jobs, now operates sixty-seven Model 20 White buses, which is one of the largest bus fleets in operation outside the United States. All of these jobs are equipped with eighteen-passenger bodies.

## *New Advertising Literature*

**International Engineering Corporation, Malden, Mass.,** has issued a pamphlet describing the working of the International "Automatic" Painting Machine.

**Heine Boiler Company, St. Louis, Mo.,** has issued Bulletin 54, an illustrated pamphlet on the Lent-tube boiler V-type. The construction, design and need of this equipment are discussed in its pages.

New York, April 19, 1924

Electric Railway Journal

*Consolidation of Street Railway Journal and Electric Railway Review*

Published by McGraw-Hill Company, Inc.

HENRY W. BLAKE and HARRY L. BROWN, *Editors*

*Volume 63*
*Number 16*

## Possible City Operation for New York, but with Service at Cost

AT THE present time it is somewhat difficult to forecast all the effects of the rapid transit bill passed in the closing hours of the hectic session of the New York State Legislature, recently adjourned. It came about through a compromise effected by the Governor between the divided houses of the Legislature, which resulted in the passage of a measure giving a modicum of home rule to New York City. It is something of an empty victory for Mayor Hylan, for while his opponents apparently weakened at the last moment and permitted the bill to pass, it allows far less transfer of authority to the city than had been demanded. The compromise plan, however, had the approval of Governor Smith, and he presumably will sign it.

The salient feature of the act is the creation of a new Board of Transportation of three members, to be appointed by the Mayor, who will have authority to undertake the planning and construction of new rapid transit railroads. These lines may be operated by the city if it so elects, under conditions which are outlined in the bill. If such operation is undertaken it must be at a 5-cent fare for the first three years. But if, at the end of this period, the 5-cent fare is not sufficient to make the lines self-supporting, including interest, depreciation and amortization on a ten-year basis of any traction bonds issued, a rate of fare must be adopted that will cover the cost of the service. It is obvious that a large deficit can be incurred in this initial three-year period of operation, judging by the results of the companies now attempting to give service on a 5-cent fare on the old-established lines with the densest traffic in the world, and constructed when costs were much lower than at present. Thus in effect an increase in fare has been legislated—if, indeed, any substantial subway construction is actually done. This prospect of higher fares will hardly be an incentive to the Mayor to push construction. He will more likely continue to stall.

It is unfortunate from the standpoint of real rapid transit that there is nothing in the act requiring the operation of any new lines that may be built in conjunction with those existing. Newspaper stories have it that it is the plan of the present city administration to make its new construction entirely independent, financially and physically, from the old systems, so that it will not have any connection with the private companies. This naturally will lead to the duplication of facilities and fares, so that the relief promised so often in political speeches if the "traction barons" were beaten would be much like the disintegration of the surface systems resulting from the Mayor's activities in that direction.

On one point the Mayor was beaten decisively. He asked for control over the existing lines and abolition of the State-appointed Transit Commission created under the Miller plan of 1921. Here his opponents did not yield, leaving the old lines in control of the Transit Commission. Thus there will be two commissions instead of one, and, if the construction program is carried out, three rapid transit systems instead of two, neither of which things is likely to work for the best interests of the city. But it appears that at least the construction of new subways is now put squarely up to the Hylan administration.

## How Much Oil per Bearing?

THE amount of oil required properly to lubricate an armature, axle or journal bearing of an electric railway car is very small, and yet it is extremely difficult to keep these parts continually lubricated. If the bearing housing has a satisfactory height of oil when the car leaves the shop, this oil is drawn up through the waste by the turning of the shaft or axle, so that after a run of an hour or two, this oil height is frequently reduced to one-third of its original value. All of the oil does not go to flood the bearings, however, and if the car is withdrawn from service, the oil will return nearly to its original level, as the bearings cool off. Modern motors are designed with an overflow pocket to take care of any waste oil.

When a car goes into service after oil has been added to the bearing chamber to bring the level to a maximum height, the amount of oil used at the start will be much greater than at the end of its run. The article by C. Bethel in this issue gives some very interesting data in regard to the relations between lift and feed of oil with wool waste. The maximum lift which can be depended upon to give a safe oil supply is found to be 3 in. While most modern railway motors are provided with an oil well separate from the waste packed portion, in most cases it is unsafe to run the motor until the oil level nears the bottom of the oil well. This fact has led some railways to make tests to determine the most economical as well as the safe height to keep the oil. In considering economy, however, the amount of oil used should be kept well above the danger point of hot bearings.

In a test on the eight identical armature bearings on the same car the amount of wear resulting was measured under use of varying amounts of oil. The amount of oil supplied per bearing varied from 1.96 gills to 0.42 gill per 1,000 miles. The wear on the bearings supplied with 1.75 gills or more of oil per 1,000 miles showed no appreciable wear, while the bearing with 0.42 gill showed wear of 0.038 in. after one month of operation, or 3,600 miles. In other words, one-sixth to one-quarter of its life had been used up.

## Cost of One Hot Bearing Would Buy Oil for Entire Life of Car

ANOTHER point that is sometimes not thoroughly appreciated is the total cost involved in a hot bearing. A careful analysis on one railway shows the average cost for a hot armature bearing to be $89. This amount includes only the actual cost of making repairs, and does not take into consideration the loss in revenue due to withdrawing the car from service, or the loss of good will from inconveniencing passengers and interrupting service. Other analyses indicate an average cost of $100 to $125 for a hot bearing.

The cost of $89 for one hot armature bearing would pay for 523 gal. of oil at 17 cents. Here is what this means. With an average consumption of 1 gill of oil per 1,000 miles per bearing, and considering a two-motor equipment with four armature bearings, four axle bearings, and eight journal bearings, this amount of oil would be sufficient to lubricate the car bearings while it operates over 1,000,000 miles, or through a period of 25 years—the life of the car, or more. Lubrication costs, viewed in terms of hot bearings, are startling. The point serves to emphasize the value of using good lubricating materials and plenty of them.

## How Not to Repair Special Trackwork

THEY'RE digging up the intersection at X Street and Y Avenue again. That's the sixth time it has been opened in the past year, just to tighten up a few bolts, weld a little metal on the manganese inserts, weld on a few more plates, and patch things up generally so that the cars can get across the intersection without jumping the track. Once again the crossing will be placed in shape to serve for a few months more.

Every time the track is torn up the cars are delayed while the men working on the job climb out, and the men are delayed while the cars go by. And street traffic must go around the opening and the piles of earth and paving dug out of the track.

Anybody with half an eye can see that the hard centers are worn, battered and broken practically beyond effective repair. They have been welded and rewelded until they look like they had a severe case of smallpox. The body of the special work is worn so that no insert could be made to fit. The men don't even try to make them fit, but just weld in a little metal so they will stick together.

If the road were to be abandoned, this policy wouldn't be questioned. But there is every indication that street cars will continue to be needed indefinitely, and this intersection is where two important thoroughfares in a big city cross. How many more times the intersection can be patched up before it finally falls to pieces so that it has to be taken out is hard to tell, but judging from the past the evil day will be put off as long as possible.

The worst of it is that too much track repair work is done this way and the track superintendent thinks he is doing a good job and saving money for his company.

But if cost figures could be assembled it is probable that it would be found that enough has already been spent here to pay a large part of the cost of a new intersection. There comes a point in depreciation beyond which it is poor economy to continue to spend money in making further repairs instead of a replacement. Obviously, when it has become necessary to open up an intersection six times in one year, this point has long since been passed. This is true from the point of view of the track man alone, but in addition to that, were enough of an appropriation made to do a real job, the result would be reflected in lower maintenance of cars, fewer delays to the service and enhanced good will of riders and other users of the street.

## Pittsburgh Company Sets Out to Sell Its Product

THE term "selling transportation," as applied to American electric railways, is apparently finding its most concrete expression in the recent establishment of a "commercial department" by the Pittsburgh Railways, to function along the lines of an executive organization and with broad scope and powers, as set forth elsewhere in this issue.

The fare schedules in the Greater Pittsburgh district are probably the most diverse in America because of the nature of the territory and the variety of communities served. No better example could have been found for the application of commercial principles because apparent inequalities will always exist under any fare plans that can be devised. It is therefore well that the solution of the many problems should be left to an organization which starts from the angle of more net from sales instead of more net from skimped service, and one that is freed of all production responsibilities.

Quite naturally, the commercial department absorbs the publicity and public relations work that is found today on many other electric railways as a sort of appendage to the general manager's or transportation superintendent's office. In Pittsburgh the temporary smoothing over of a complaint will go hand in hand with whatever fare and service changes can remove that complaint permanently. This means plainly that the commercial department is an executive organization responsible for many decisions and functioning in relation to the general manager, as does the sales manager of a department store, for example, to the general manager of that store. The latter does not set the prices for the sales manager. He merely demands that the net result shall be in black instead of red. So will it be in Pittsburgh. The commercial department is the one that within a wide range of discretion will set rates and standards of service. The transportation department's job is that of producing the goods requested with least expenditure in men and equipment.

The variety of things started by the commercial department in its first ten weeks of activity shows what it is to have an organization of genuine sales responsibility. This department must be ever on the *qui vive* for business, and it must have no more hesitation about trying new rates at frequent intervals than has the merchant who not only varies his prices with quality, quantity and the seasons, but also with the days of the week. It is just this flexible adjustment to its business opportunities that has been so sadly lacking under the rigid fare and service plans of this country. Now that one of our greatest city and interurban systems has shown that it means to use merchandising principles in selling rides, the industry may have some practical demonstrations of this much talked of theory that will be very helpful.

# Packing Railway Motor Bearings for Oil Lubrication

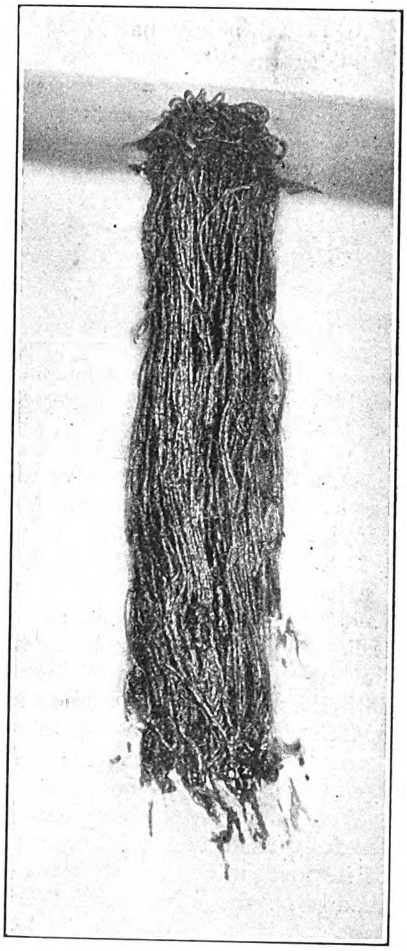
### Wool Waste Is Most Satisfactory for Packing, but Care Must Be Used to Insure Feeding the Proper Quantity of Oil—Essentials Are to Keep Shell Tight and Clearance Small—Proper Design of the Oil Grooves Is Necessary

*By C. Bethel*
Railway Motor Engineer Westinghouse Electric & Manufacturing Company

RECENT tests, both in the laboratory and in service, made to determine the main factors affecting the operation of waste-packed bearings have had results defining quite clearly the factors necessary for successful bearing operation. When the bearing is correctly packed with a good grade of long strand wool waste, the oil level is kept within the correct limits, and reasonable care is taken to exclude dirt and to maintain the clearance, the useful life of the bearing can be greatly extended.

The condition of the bearings in a railway motor determines more than any other one thing the amount of general maintenance necessary. With bearings in good condition and with close clearances the motor maintenance resulting from abnormal vibration will be low. Taking advantage of all that is now known regarding the action of waste-packed bearings, a material improvement in bearing life should be obtained over average practice.

Modern waste-packed bearings are rugged and reliable; in fact, they are so simple that the underlying principles of their operation are likely to be overlooked. Although bearings are commonly regarded as performing satisfactorily if they run cool, this is not a reliable index of good bearing operation. Sufficient oil may reach the bearing to keep it from getting hot, but still a rapid wear of the bearing may take place. The mileage of railway motor bearings has been found to vary from 50.000 to 250,000. Some of this difference is, of course, due to differences in service, but most of it is due to variations in lubrication and bearing practice. The waste-packed bearing consists of a babbitt-lined bronze shell which is pressed into the motor housing and is provided with a window into which the waste is packed. This waste communicates with an oil chamber in the housing and carries oil by capillary action to the journal. This is the only source of oil supply.



A Long Strand Wool Wick Such as This Should Be Prepared for Feeding Oil to the Bearing Window

A certain amount of wear will be present with the best of lubrication. This wear is an inverse function of the amount of oil supplied to the bearing. Therefore, first consideration should be given to the oiling of the bearing. The amount of oil required to lubricate the bearing properly depends on the size of the bearing and the work that it does. The amount of oil that the bearing actually gets depends on (1) the kind of waste used; (2) the height of lift, i.e., the distance from the oil to the window; (3) the kind of oil used, and (4) the quantity of waste carrying oil to the window.

Many tests made to determine the capillary characteristics of different grades of waste and other packing materials have brought out a number of interesting characteristics. For example, the ability of four common materials to lift oil is in the following order: (1) Lamp wick; (2) cotton waste; (3) felt, and (4) wool waste, the latter being the poorest in this respect. This

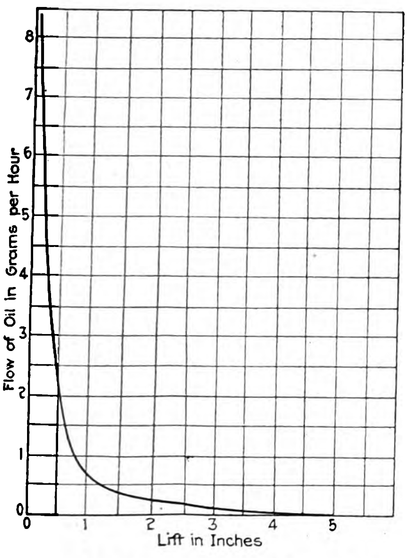


Fig. 1—This Curve for a 40-Hp. Motor Shows the Decrease of Oil Flow with the Lift

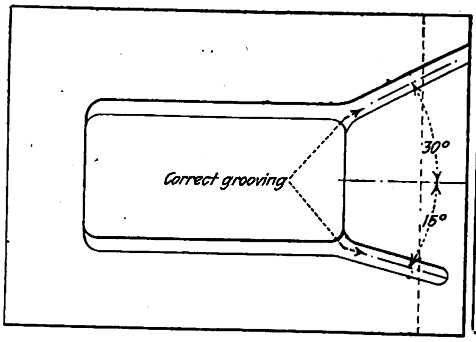


Fig. 2—An Arrangement of Oil Grooves with Edges of Windows Chamfered that Has Proved Satisfactory

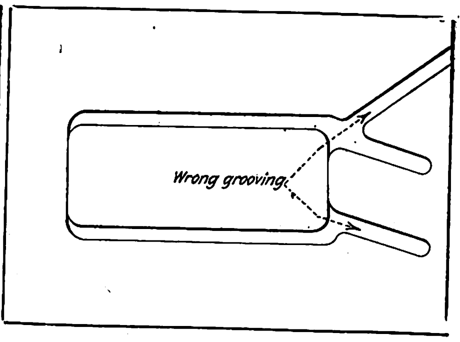
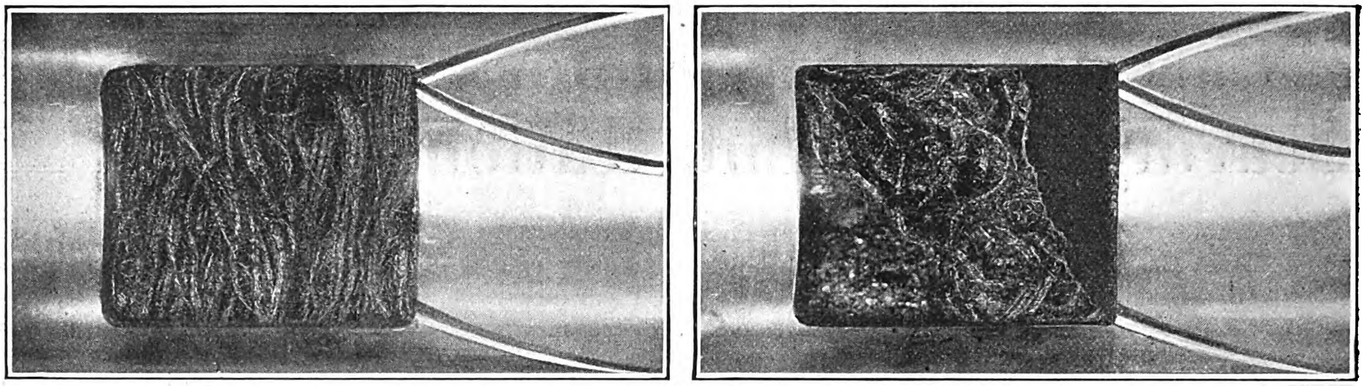


Fig. 3—With the Incorrect Grooving Shown It Is Not Possible to Drain the Chamfer Properly



At Left—Section Through Bearing Showing Appearance of the Long Wool Strands When Correctly Packed. At Right—In an Incorrectly and Loosely Packed Bearing the Waste Is Seen to Be in Balls Rather than in Wick-Like Strands. Note that the Waste Does Not Fill the Window Completely

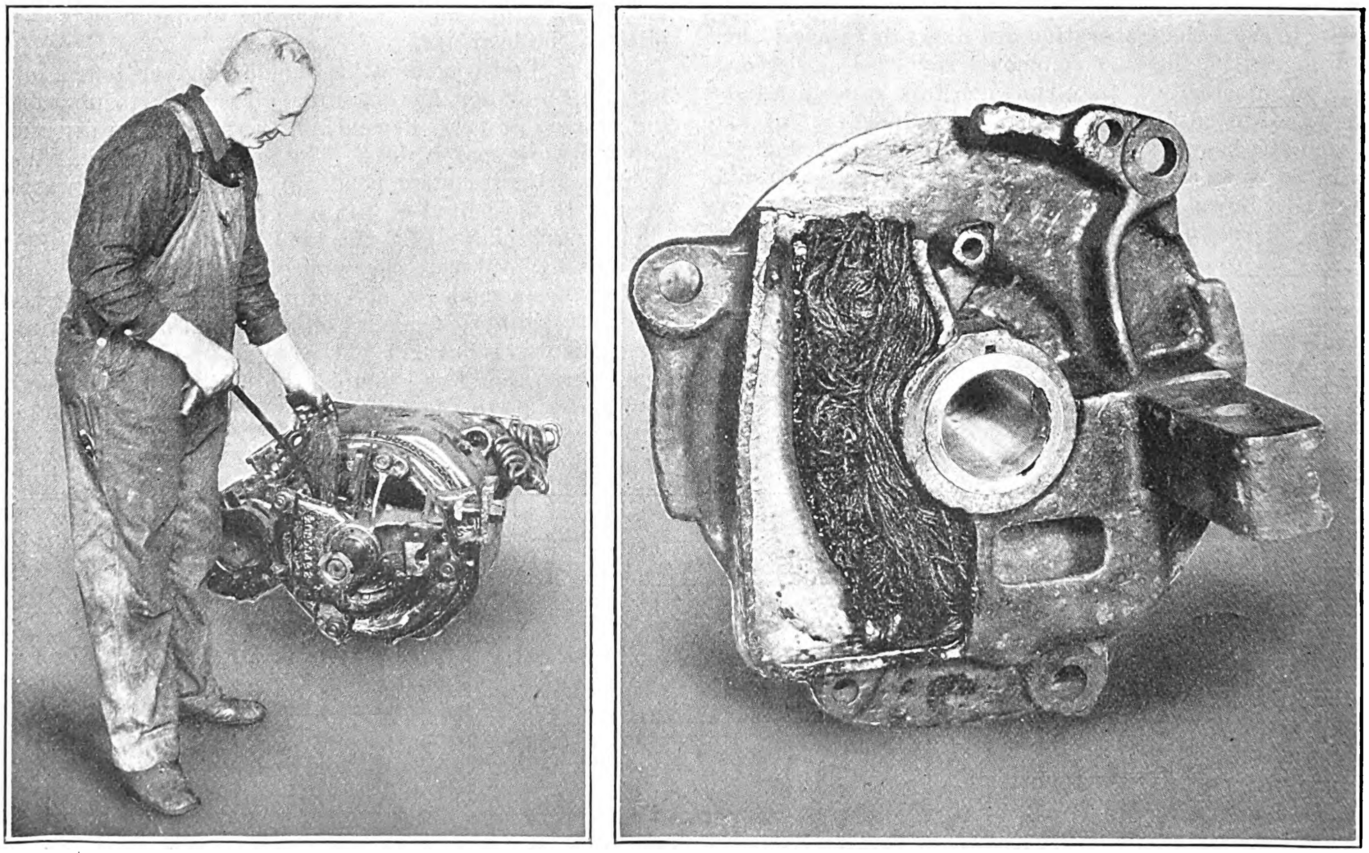
is shown by the comparative distances the oil is lifted after a considerable time, as shown in one of the accompanying illustrations.

Felt has been used successfully in some bearings, particularly where there is a positive, independent oil feed which keeps it well saturated. An example of such use is on electric locomotive jackshaft bearings. But in the usual type of bearing, where the packing both lifts the oil and applies it to the journal, felt is unsatisfactory, as it will glaze when the oil supply becomes lean. Cotton materials are unsuitable as a packing for bearings because they glaze so readily.

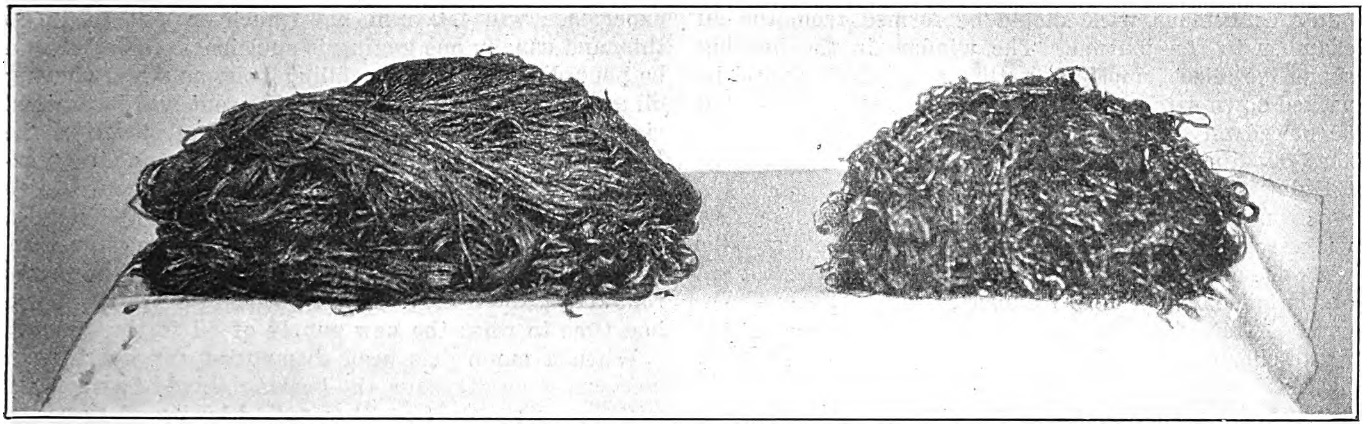
Wool waste is the only material that has been successfully used as a packing material. This is because of its mechanical characteristics. It does not glaze as readily as the other materials and it is not so inert, hence it is not so liable to be jolted away from the journal. Since wool waste is desirable on account of its mechanical characteristics, it is important that its relatively poor capillary properties be compensated for as far as possible by securing a long strand wool waste, free from adulteration.

The capillary characteristics of wool waste are shown by the curve in Fig. 1, where the quantity of oil lifted is plotted against the height of lift. This curve is for medium car oil operating at bearing temperatures (viscosity, Saybolt, 54 at 100 deg. C.). The important points illustrated by it are:

1. The maximum possible lift is 5 in.
2. Maximum lift for the minimum safe oil supply is about 3 in.
3. The minimum lift for reasonable economy in oiling is about ¾ in.
4. For further decrease in lifts the oil feed increases quite rapidly. The feed at ½-in. lift is twenty times that at 3-in. lift.



At Left—Packing a Railway Motor Bearing Correctly, Showing How the Wick Should Be Put in Place. At Right—A Correctly Packed Pinion End Housing. The Outer Shell Has Been Cut Away to Show the Wick in Place



**Amounts of Waste Taken from Bearing Housings—at Left, from a Correctly Packed Housing; at Right, from an Incorrectly Packed Housing**

5. The correct lift for this grade of oil is from 1 to 2 in. For the pinion end bearing of a 40-hp. motor in average service this will give an oil consumption of approximately 1 gill per 1,000 miles.

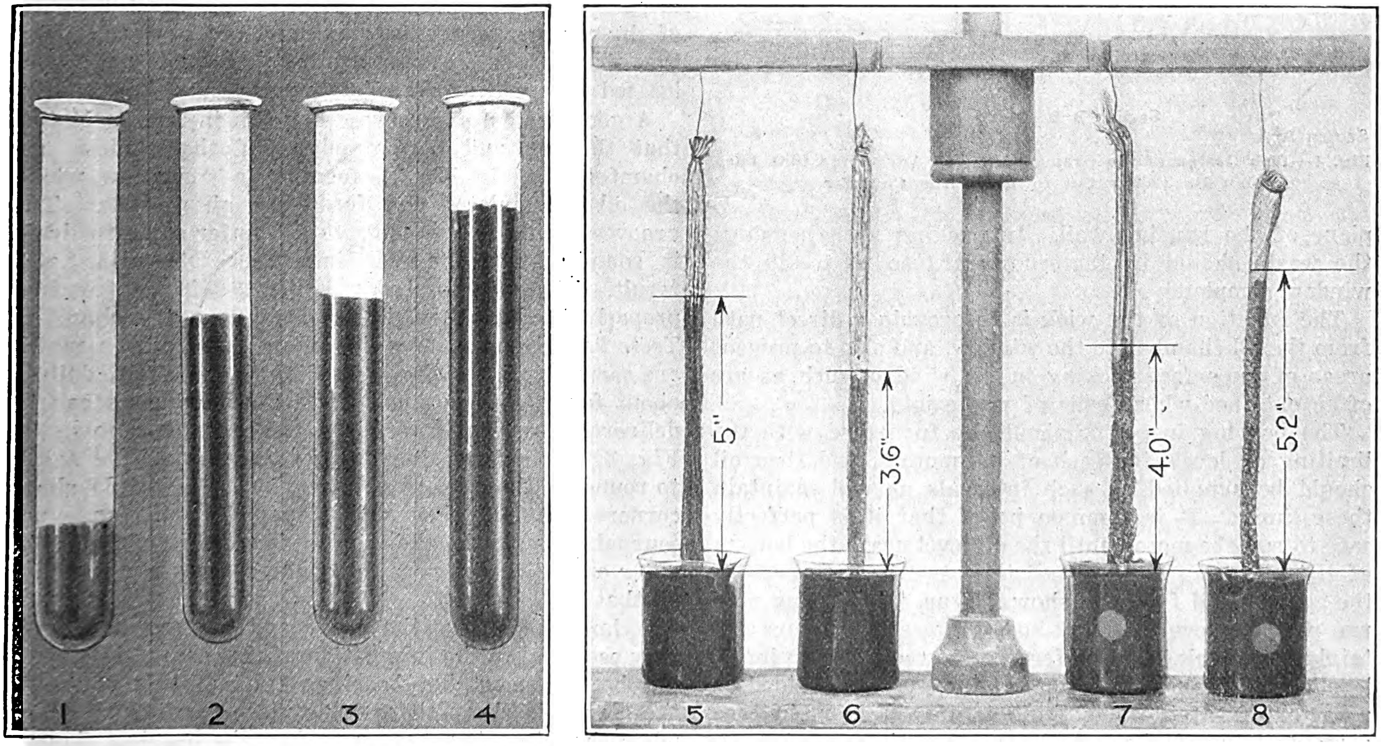
The curve shown represents conditions for a medium oil. Other tests show that viscosity is an important factor in oil feed. A heavy car oil gave a feed of only about one-half that of the medium oil. This indicates the importance of changing promptly from summer to winter oil at the right time, as otherwise a feed that is too lean will result in cold weather. Even then the oil may become very heavy in cold climates. In such cases a shorter lift should be used, ranging from about ½ in. to about 1½ in. It may even be advisable to use shorter oiling periods during the winter months to maintain these levels. These practices must be worked out for each case.

The quantity of waste used was found to be just as important as the quality, for the oil feed was very nearly proportional to the amount of waste in the wick. The amount of oil fed to the bearing also was found substantially proportional to the amount of waste in contact with the journal, showing that anything short of a full window is cutting down on the necessary oil supply, a point often overlooked.

These capillarity tests showed that another fundamental characteristic of waste-packed bearings is the time required to lift oil a given distance. This varies slightly with different materials. To obtain the maximum possible lift of 5 in., previously given for wool waste required sixty-six hours for the particular oil used. This explains why the oil feed is so low at the long lifts, and why it is important to prevent the oil level from running too low.

### METHOD OF PACKING THE BEARING IS IMPORTANT

The importance of properly packing the bearing is not generally appreciated, and bearings often are put in service with imperfect packing. A number of points should be watched in packing a bearing correctly. A good grade of long strand wool waste should be used, and it should not be pushed into the housing in balls,



**The Test Tubes Contain Amounts of Medium Grade Oil that Various Materials Will Lift Under the Same Conditions. At Right—The Actual Heights to Which a Medium Car Oil Rose After 66 Hours Immersion of the Lower End of the Wick**

1 and 5, Wool strands. 2 and 6, Black felt. 3 and 7, Cotton wick yarn. 4 and 8, Lamp wick.

but a continuous wick should be formed from the oil chamber to the journal. The window in the bearing should be filled completely with waste, which should be packed down firmly, and a separate wad of waste should be placed on top of the main body of the packing to keep out dirt. A number of these points are shown in the illustrations.

The first step in packing the bearing is to prepare a wick from a bunch of oiled waste, as illustrated. This wick should be long enough to reach from the bottom of the oil chamber up to and across the bearing window. After this has been placed in the housing the waste chamber should be filled up by tamping waste in behind the wick, using care to force the wick firmly against the window. In some housings, especially on the larger motors, and on the pinion ends of most motors, the window extends a short distance inside the plane of the housing wall. In packing such housings the waste should be tamped inward so as to fill the window completely.

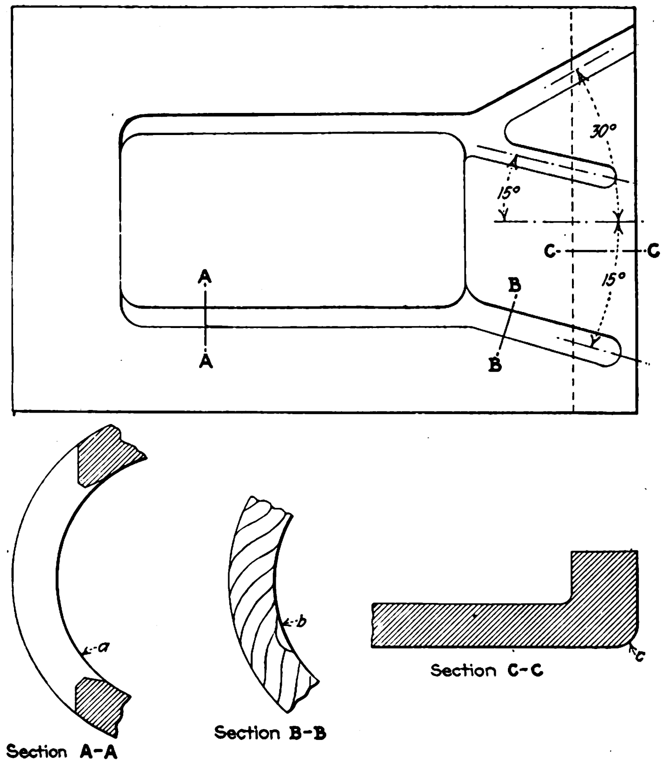


**Fig. 4—This Design of the Grooves Has the Advantage that They Can Be Easily Cut to Drain the Chamfer**

The function of the wick is to provide a direct path from the oil chamber to the window, and also to prevent areas of imperfect packing in the window such as are often obtained where balls of waste join.

The bearing inspector should be furnished with the limiting oil levels for each of his motors, and then oil should be supplied at such intervals as will maintain these limits. It is common belief that it is perfectly safe to run the motor until the oil level nears the bottom of the oil well. This is not the case, as reference to the curve of oil feed will show. True, the bearing may run without overheating, but unnecessary wear certainly will result. The difference between the minimum level specified and the bottom of the well is provided as a factor of safety—something to fall back on in case a motor is overlooked at the regular oiling period.

The oiler should gage the oil and then pour in enough to bring the level to the upper limit. A little experience will tell him how much to put in to do this, and usually one gaging is sufficient. The oil should be poured in through the filling hole, as when pouring oil on top of the waste any dirt present will be washed right into the bearing. Should the oil level in the housing become very low, however, the standard practice should be departed from and some oil poured into the waste chamber. This is best done by removing a part of the waste so as to get the oil as near the window as possible. If the regular procedure were followed a hot bearing might develop before the waste had time to raise the new supply of oil to the window.

When a motor has been dismantled for bearing replacements or overhaul, the bearing should be repacked with waste thoroughly saturated with oil and the journal smeared with oil before it is assembled again. This simple precaution will often prevent hot bearings, as the capillary action of the waste is often too slow to get sufficient oil to an initially dry journal to keep it from getting hot, especially if the motors go into hard service immediately.

### CAREFUL DESIGN OF OIL GROOVES IS ESSENTIAL

There is no such thing as a flow of oil in waste-packed bearings, as that term is understood for oil ring bearings. Only a very small amount of oil is wiped into the journal by the waste. When the journal first begins to turn, oil is carried only to that portion of the bearings which is spanned by the window, unless the journal has been previously smeared with oil. The oil then works very slowly out from the window. Starting with a dry bearing of a 40-hp. motor, it may take as long as fifteen minutes for the oil to travel from the window to the ends of the bearing.

A great problem is to keep the shell tight in the housing, and a sufficient length of the shell must be left to give the desired press fit. Therefore, oil grooves are used to aid in carrying oil from the window toward the ends of the bearing. Since the oil flow is rather meager it is important to obtain the correct location of the grooves to get the maximum aid in distributing the oil. If the grooves are not properly made and located they will prove a detriment rather than a help.

A good system of grooves is shown in Fig. 2. Notice that the top and bottom edges of the window are chamfered, as in Fig. 4, forming a trough in which the oil accumulates and feeds the oil grooves. The grooves should be cut from the chamfer so as to drain it completely. Otherwise imperfect lubrication will result. The grooves shown in Fig. 3 will not function properly because they do not lead from the chamfer. Tests have been made which show that grooves which are correctly cut as shown in Figs. 2 and 4 will deliver about four times as much oil to the bearing as can be delivered by the imperfectly cut grooves shown in Fig. 3. In cutting the grooves care should be taken to round off the corners as shown at *b*. Fig. 4. If sharp corners are left they will scrape the oil from the journal. As a rule, the window is close enough to the outer end of the bearing to render grooves unnecessary at that end.

A large radius at the collar end of the bearing is very essential to the lubrication of this end of the bearing because most hot bearings start at this end. If the corner is sharp there is no place for the oil to go when the wiper is pressing against the bearing flange; in fact, the oil must flow against a slight pressure. With a large radius, a place is provided for the oil to drain into without resistance and a more positive feed to the bearing flange is provided.

Bearings should be started in service with the minimum clearance that will permit the oil to flow freely between the journal and the bearing. Very little work has been done toward the determination of the thickness of oil films for waste-packed bearings, but experience has shown that satisfactory clearances between the journal and bearing, measured after the bearing is pressed into the housing, are 0.006 in. for journal diameters up to 3 in., 0.007 in. between 3 and 4 in., 0.008 in. between 4 and 5 in. and 0.009 in. clearance for journals between 5 and 6 in.

The importance of close bearing clearances, especially in maintaining the gear centers, cannot be overestimated. The main items of motor maintenance are due to mechanical failures or to electrical troubles induced by them. An analysis will show that vibration is the underlying cause of most of these failures, and that a main cause of this vibration is improperly meshed gears, due to worn bearings. This vibration increases at an accelerated rate as the bearings wear. If the bearing wear is reduced and close clearances maintained the upkeep of the bearings will be reduced, and the general motor maintenance will be lessened.

The maximum operating clearances depend upon the size of the motor. Take, for example, a 40-hp. motor with 3½ diametrical pitch gears. With a ⅛-in. wear of the axle bearing and a 1/16-in. wear of the armature bearing there will be a spread of the gear centers approximately 3/32 in., or about one-fifth of the gear mesh. Such clearances are quite common, and often they are greater, with correspondingly more severe vibration. Greater over-all economy can be obtained if the bearings on a 40-hp. motor, for example, are removed at clearances of 1/16 in. and 1/32 in. for the axle and armature bearings respectively. These clearances may be safely doubled for motors using 2½ and 2 pitch gears.

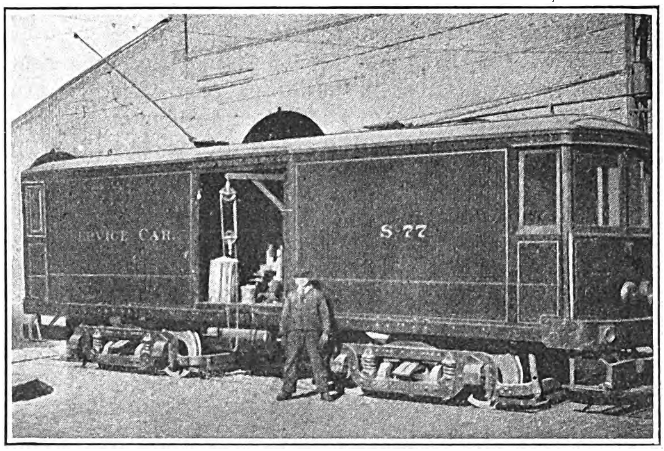
A large amount of bearing trouble could be eliminated and lower cost of bearing maintenance obtained if the job of packing and oiling the bearings were placed in the hands of skilled men, who could be held responsible for the condition of the bearings.

## Well-Equipped Wrecker Proves Its Worth

An efficient type of wrecking car is in use on the Union Street Railway, New Bedford, Mass. This car was specially built for the purpose and is equipped with the heaviest trucks and most powerful motors that the railway had available. Complete wrecking equipment, including a convenient work bench, is inside the car. A red band is painted on each tool to discourage removal from the emergency car for use elsewhere in the shops.

The car is equipped with a special derrick on the side, as shown in the accompanying illustration. This is used principally for swinging out pony trucks and placing them on the adjacent track. On the bumpers are several cast-iron sockets which serve as receptacles for the ends of push poles.

The crew comprises four men, including the master mechanic. A special bell call, No. 13 on the auto-call system in use in the shop, is used for emergency. Upon hearing this signal these men instantly leave all other work and proceed to get out the wreck car. There is an overall locker in the car so that men who respond to an unexpected call can don their overalls on the way to the job. Although the need is infrequent, the railway considers it an economy to maintain a thoroughly equipped wreck car.



Pony Trucks for Use in Case of Accidents Are Swung Off the Wreck Car by Means of a Derrick

## Maintaining Automatic Sprinklers

### Record of 95.7 per Cent of Fires Controlled in Sprinklered Buildings Can Be Increased to 99 per Cent with Proper Inspection and Maintenance

The wide use of automatic sprinklers in all types of buildings has led the insurance committee of the Chamber of Commerce of the United States to include a leading article on the subject in its publication, *Fire Prevention Bulletin.* The following abstract gives information of value to electric railway men in the maintenance of sprinkler systems:

After a fire has been extinguished by sprinklers the control valve of the operating sprinkler system is closed and the water drained from the system. The sprinklers which functioned are then replaced and the valve reopened. A man should be kept at the closed valve until restoration of the protection, holding himself ready to turn on the water should fire again start.

It is advisable to force all air out of the piping when refilling it with water. This can be done by opening a small test valve which is usually found at the top of the sprinkler system. The valve should be closed when all of the air is exhausted and water begins to flow through it.

When continuous heating of buildings at all times, including idle periods, is not feasible, a dry-pipe automatic sprinkler system is often installed. In this type air replaces water in the pipes. It is under sufficient pressure to keep closed a device known as a dry-pipe valve. In the event of fire the air escapes through sprinklers which are opened by the action of heat upon their soldered links. When the air pressure is decreased sufficiently the dry-pipe valve opens and allows water to flow through the pipes.

Following a fire which has been controlled by a dry-pipe sprinkler system, the water valve is shut, the entire system drained and the fused sprinklers replaced. It is then necessary to reset the dry-pipe valve. This work should be done by a mechanic who is acquainted with the construction and operation of the valve. The system is next refilled with air to the original pressure and the control valve opened so that the sprinklers may be ready to function at any time.

The National Fire Protection Association has compiled a record of fires in buildings protected by automatic sprinkler systems. The list comprehends a period of twenty-six years and a total of 28,814 fires in sprinkled properties, as tabulated below:

RECORD OF AUTOMATIC SPRINKLERS

| | Number | Per Cent |
|---|---|---|
| Extinguished fires | 19,007 | 66.0 |
| Checked fires | 8,583 | 29.7 |
| Satisfactory control | 27,590 | 95.7 |
| Unsatisfactory control | 1,224 | 4.3 |
| | 28,814 | 100.0 |

A large portion of unsatisfactory controls is due to improper maintenance. The reasons for and extent of this unsatisfacory experience are summarized by the National Fire Protection Association as follows:

CAUSES OF UNSATISFACTORY CONTROL

| | | Per Cent |
|---|---|---|
| *1. | Water shut off from sprinkler systems | 29.3 |
| *2. | Generally defective equipment and unsprinkled portions | 20.0 |
| *3. | Defective water supply | 9.3 |
| *4. | Freezing of water in sprinkler systems | 3.3 |
| 5. | Slow operation of dry-pipe valves or defective valves | 2.7 |
| 6. | Slow or defective operation of high temperature automatic sprinklers | 1.8 |
| *7. | Faulty building construction, sealed spaces, unenclosed floor openings, etc | 5.1 |
| *8. | Obstruction to distribution of water from automatic sprinklers | 5.7 |
| 9. | Hazards of occupancy too severe for ordinary sprinkler system | 5.7 |
| 10. | Explosions crippling sprinkler systems | 4.5 |
| 11. | Exposure fires or conflagrations | 5.8 |
| *12. | Miscellaneous | 6.8 |

The items preceded by an asterisk (*) indicate the faults which may be corrected by property owners. Based upon the experience of this twenty-six-year period, these conditions are responsible for fully 75 per cent of unsatisfactory fire control by automatic sprinklers and, if remedied, the efficiency of performance of sprinkler systems should rise to 99 per cent.

Water shut off from sprinkler systems is by far the chief reason for unsatisfactory results. It is due mainly to indifferent maintenance, as indicated in a classification of 360 fires which were not controlled because water was shut off from the sprinkler systems. The causes for shutting off the sprinklers in 134 of these cases were unknown or were due to neglect or carelessness. In seventy-three cases the sprinklers were shut off to prevent freezing.

Whenever a sprinkler control valve is closed, shutting off water from all or part of a sprinkler system, some one should be stationed at the valve ready to open it in case of fire. In the event repairs are being made, it is not always necessary to keep water from the entire system while the work is being done. Temporary connections can sometimes be made which will supply water to at least a portion of the section which is undergoing repairs.

Some sprinkler valves are closed in the winter months to prevent freezing. In general dry-pipe valves should be used in such places. If any valves are closed for the winter months, they should be tagged and a record kept by the man supervising the system in order that they will not be forgotten in the spring.

Water control valves are often sealed. The seals should not be broken and valves closed without permission from some one in authority upon whom will rest the responsibility of seeing to it that the valves are opened again as soon as possible. On many properties inspections of all valves are made daily to insure that they remain open and in proper operating condition.

There are mechanical methods available for facilitating a constant check of sprinkler control valves. Some of them give an alarm whenever a valve is closed. One of these methods is the so-called central-station supervisory service which keeps the entire sprinkler system under constant supervision. Another system provides watchmen's stations at each sprinkler valve. These stations cannot be recorded if the valve is closed.

Such conditions as badly corroded or painted sprinkler heads should not be permitted. Inspection departments are usually glad to test suspicious sprinklers.

Among the sources of water supply are connections to public water systems, gravity tanks, pressure tanks and private pumps. The condition of the source or sources of water should be under constant observation in order that there may be no impairment of the supply. In general, tanks should be filled weekly. Pumps should be turned over periodically to determine their operating condition.

Buildings equipped with sprinkler systems containing water at all times should be heated throughout in freezing weather. Water in the ends of pipes near windows, especially if the latter are left open, is likely to freeze. This will burst fittings or the automatic sprinklers themselves, thereby crippling the system. In cases where dry-pipe sprinkler systems are used, care should be taken that they are absolutely free of water. Because of improper draining or condensation, small quantities of water sometimes remain in the pipes. A small drain can be opened which will permit the air pressure to expel the water. It is suggested that this be done by employees acquainted with dry pipe systems.

Alterations such as the installation of partitions, wide shelving, storage racks and platforms, benches, etc., may form serious obstructions to the proper distribution of water from sprinklers. This condition may be remedied by introducing frequent openings in the obstructing surfaces or by installing sprinklers below them. Alterations should be so made that water from the sprinklers can cover the entire area without hindrance.

Improper piling of stock is often a cause of insufficient water distribution. The full effective action of sprinklers requires about 24 in. of clear space below the sprinkler heads so they may form an unbroken spray of water from sprinkler to sprinkler and to the side walls and partitions.

This cause of unsatisfactory control is increasing in extent. An automatic sprinkler system is intended primarily to control fire at its place of origin, but this is not assured when individual sprinkler heads cannot completely distribute water over the entire area allotted to them.

### SELF-INSPECTION SYSTEMS

Owners of property equipped with automatic sprinklers will find it advisable to establish some form of self-inspection for all fire protection equipment, including automatic sprinkler systems and apparatus used for manual control of fire such as hose equipment, hydrants, extinguishers, etc. Whatever may be necessary properly to establish such a system can be ascertained from such sources as the engineering departments of fire underwriters, inspection departments, independent inspection bureaus and insurance agents. Some automatic sprinkler companies have service departments which assist in maintaining sprinkler equipments.

# Correct Welding Procedure Retains Qualities of Manganese Steel

### By Use of Arc Welding in the Field, Life of Manganese Steel Special Work Can Be Increased One to Five Years — Type of Welding Rod, Technique Employed and Speed of Cooling All Affect Physical Characteristics of Welded Material

*By Howard H. George*
Engineer Maintenance of Way Public Service Railway, Newark, N. J.

IT IS generally acknowledged that a good weld of any steel depends largely upon the skill and experience of the operator. This is particularly true of manganese steel, but the common difficulties are greater than with ordinary steel and there is the added trouble due to the effect of the heat in producing brittleness in the manganese casting. It has been found, however, that careful selection of the welding rod, manipulation of the arc and regulation of the speed of cooling of the weld will make repairs that have sufficient life to justify the use of the process in the maintenance of manganese steel special work.

The use of the electric arc for track welding goes back twelve or thirteen years. During this time its growth has been phenomenal. At first used only for welding splice plates or bars to the rails, its application soon spread to building up the heads of rails where cupped at the joints and then to the repair of manganese steel inserts in special trackwork, and also for welding breaks in solid manganese steel pieces. As usual with a new process, but little attention was given to the theory, and what was actually taking place under the arc was scarcely understood. The natural result was that many failures occurred in the early work, and many disappointing results were obtained.

As the process developed, more and more attention was given to analysis of questions such as the determination of what was actually occurring under the arc, the effect of the heat generated on the physical characteristics of the steel being repaired, the chemical and physical requirements of the welding rod and the comparative results obtained by different welding methods. The accurate determination of these and many other questions was found essential in order to improve the technique of arc welding. A comprehensive investigation of the arc welding process for rail joints is now under way by the welded rail joint committee organized under the direction of the American Bureau of Welding, and it is expected that this work will develop valuable data. The manufacturers of arc welding apparatus and also those manufacturing welding rods are now conducting independent investigations to determine what has been wrong with past practice and what should be done to correct these errors.

The industry must be prepared to make some radical changes in the near future in the method of application of the arc weld process now in general use, particularly with respect to joint work. This should not discourage the use of the process, which is merely going through the same form of development that has been experienced with practically everything connected with the operation and maintenance of the street railway. The changes resulting from the combined efforts of the various investigators naturally will be for better and not for worse.

## ATTENTION TO DETAILS OF PROCESS IMPORTANT

Formerly, it was thought that all that was required in the welding process was to heat up the rail head or steel surface to be restored and fuse in with it some additional metal. It is now becoming generally recognized that successful welding requires a definite technique, including a certain polarity and a fairly definite manipulation of the arc. The temperature is also found to be an important factor. For a certain composition of rail steel or manganese steel casting, it is now understood that a reasonably definite chemical analysis of welding rod and, in the case of joints, of splice bars is essential. Also, in practice it is found that an electrode with positive polarity gives better welding characteristics and that the loss of carbon and manganese in the deposited metal is less. When welding with manganese steel either on manganese or on high carbon steel, it is advisable to form a rather wide deposit by a slight oscillation of the electrode so as to give a deposit approximately double the width of that obtained by drawing the electrode along a straight line. By this manipulation of the arc, the deposited metal is kept in a molten state for a somewhat longer period, allowing time for the escape of any gas which may be included in the deposit, and thus preventing the formation of blow holes. The manipulation produces a puddling effect and makes more certain the complete alloying in the deposited metal of the ingredients in the rod and its coating.

## WELDING CAN BE USED FOR MORE THAN TEMPORARY REPAIRS

Welding in the street with the manganese process has, up to the present stage of its development, generally been considered as a very temporary or emergency repair proposition. With the improved alloy steel rods now being developed, however, in many cases the results being obtained are considerably better than what might generally be considered as temporary repairs. This class of work is of double importance from an economical standpoint because of the great cost of special trackwork as compared with straight rail, and because of the delay sometimes experienced in securing delivery of replacement pieces. It is of course not practical to carry in stock sufficient renewal pieces to cover every emergency that may arise, by reason of the special character of the various special trackwork designs. Ordinarily, when a switch tongue breaks, it is possible to renew the tongue from stock because of the limited number of types of tongues which are usually found on any given property and which need to be carried in stock. But with a combination frog or solid manganese mate, for instance, this becomes an entirely different matter.

It obviously is impossible to determine definitely what added life can be secured from a special piece such as a frog or mate, where the manganese insert has been built up by arc welding. This depends on such factors as the skill of the workman, method and materials employed, the extent of deterioration of the piece at the time repairs are attempted, general track conditions, and care taken in subsequent grinding of the surface after welding. Many otherwise satisfactory welds on manganese inserts have failed prematurely either because of neglect to grind promptly or failure to see that this part of the work was properly done, thus imposing stresses in the welded metal considerably beyond its ability to withstand, and hastening its failure. While in some cases repairs with every appearance of a satisfactory weld have failed within a very short period, it is not believed that this is the general experience with welded repair work.

Considering the cost of replacing the special piece as compared with the cost of temporary repairs with the arc weld process, it is generally felt that if an additional year of life can be obtained the expense of making repairs is fully justified. This increase in life is not unusual by any means. As a matter of fact, even though the work was done during the experimental period when the present improved welding rods were not known, and when the operator was not as well informed as to the requirements for a successful weld as he is at present, this additional year of life has frequently been exceeded, and two years of additional life often has been obtained. This latter figure probably should be more correctly considered as representing the average increase to be expected. Numbers of cases have been reported where the increase in useful life due to welding has gone as high as five years, and with our increased knowledge of the process and improvements in welding apparatus and materials, it is even reasonable to believe that this will be a usual expectancy.

In some cases arc welding repairs would be entirely justified even though they lasted but a few weeks, for this would give the engineers sufficient time to secure a new piece from the special trackwork manufacturer and would enable them to keep traffic moving during the interval without excessive damage to the remainder of the track or to the equipment.

### REPAIRS SHOULD BE MADE PROMPTLY

It is desirable that repairs be made when the failure of the manganese is in its early stages and before the balance of the structure has been affected by the excessive pounding of the car wheels over the broken insert or casting. It is quite probable, for example, that in the case of filling blow holes or sand holes which are occasionally encountered in casting, sometimes discovered before the piece has been put in service and sometimes developing shortly afterward, the work is more or less in the nature of patchwork but generally there is sufficient actual fusion of the two metals to justify calling the operation a weld.

The nature of the problem will be better understood when it is explained that when the manganese content is increased above 2 or 3 per cent the strength and durability normally decrease while the hardness increases. Manganese frogs and crossings contain between 11 and 13 per cent manganese. Opinion varies as to the chemical analysis of the deposited metal as compared with that of the welding rod. The manganese content of the welding rods now commonly used probably will vary from about 10 to 15 per cent.

Tests made by one company indicate that, using bare electrodes, the loss in manganese will vary from 1½ to 2½ per cent. These tests indicated that while a coating stabilizes the arc, with most of the coated rods available on the market the manganese loss was at least equal to that secured when using bare electrodes, due to absorption of the manganese by the fluxing material. The conclusion reached as the result of these tests was that since experience dictates that the manganese content of the wearing surface preferably should exceed 10 per cent, it is desirable to employ electrodes in which the manganese does not fall below 12 per cent. It has been found possible to secure in the deposited metal manganese content equal to or greater than that in the electrode by coating the rod with powdered manganese. The use of such a coating obviously permits the utilization of manganese steels having a wider range in manganese content.

### EFFECT OF PHYSICAL TREATMENT ON STRENGTH OF METAL

It is considered essential that the heat of the arc be kept at the minimum required to bring the metal to the point of fusion and that the overheating of the steel be minimized as far as possible. The following abstract from a report made several years ago by the metallurgist of one of the large manufacturers of manganese steel trackwork castings will emphasize the necessity for this:

> In its cast condition, manganese steel is extremely brittle, so much so that, when broken, a test bar of untreated manganese steel will give almost no angle of bend. In order to confer upon the metal the toughness which is so important a property in all its applications, the casting after it is taken from the mold is heated in an annealing-furnace to a temperature of approximately 1,050 deg. C. or 1,920 deg. F. After being heated to this temperature, the steel must be quenched in cold water, and it is important that it be put in the water as soon as possible without allowing it to cool off slowly. If it cools, even in the air, below a certain definite temperature, before being put in the water, the casting possesses very little toughness and is quite unfit for service.
>
> If the toughened steel is again heated to a temperature over 300 deg. C., it becomes extremely brittle, quite as much so as in the cast condition, and it will be brittle after heating to these low temperatures whether it is cooled fast or whether it is cooled slowly. If heated after toughening to temperatures between 300 deg. C. and 700 deg. C., the same is true, the steel being brittle even if cooled rapidly. If heated after toughening to temperatures between 700 deg. C. and 1,050 deg. C. the steel will be brittle if cooled slowly, and will be more or less tough if cooled rapidly, the toughness increasing as the temperature is raised from 700 deg. C. to 1,050 deg. C.

It is obvious, of course, that it is not practical to remove the piece and heat-treat it to give it the desired characteristic toughness. It is realized that the heat treatment of shop practice cannot be duplicated in the field, and that the next best thing is therefore to be desired. While in many cases the rapid cooling received by the arc-deposited metal in normal deposition is sufficient to give certain wearing qualities, it is nevertheless considered desirable, in the opinion of some engineers, whenever practicable to quench each layer deposited at frequent and relatively short intervals. The normal water toughening treatment amounts to raising the temperature of the metal until the desired molecular structure is produced, and then fixing it at that point by increasing the normal cooling rate. Likewise, in the case of welding manganese the metal heated to a high temperature by the welding operation is suddenly cooled from a temperature as nearly as possible equal to that for the desired structure. Naturally this localized control of the heat is not the same as where the entire casting is brought up to the required temperature and suddenly quenched in cold water. It undoubtedly results in zones of very brittle manganese steel which, sooner or later, are responsible for many of the failures which occur. It does, however, constitute the best known practice for field operations at the present time.

It is essential in trackwork where welding is to be continued to dry the surface where the arc is to be established, as otherwise difficulty will be experienced in establishing the arc. It is also considered essential that the surface to be built up should be thoroughly cleaned. The means used to accomplish this will vary with the condition of the piece, a wire brush being sufficient in some cases, whereas a portable grinder may be required in others. All grease or other foreign matter must be removed, however, no matter what means may be employed.

# Portable Pneumatic Equipment Reduces Track Reconstruction Cost

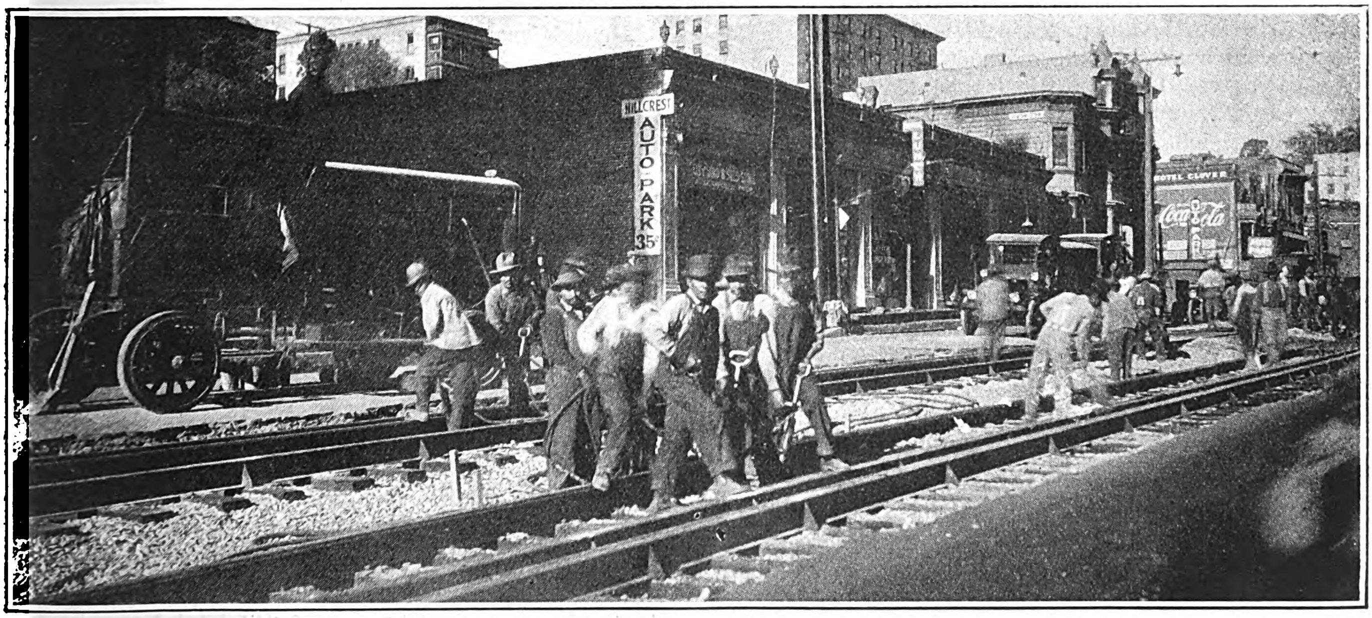
**The Expense of Ballast Tamping and Pavement Cutting on the Pacific Electric Railway Has Been Cut in Half—Greater Rapidity Is Another Advantage—Better Work Is Done if the Men Are Allowed Intervals of Rest—The Apparatus Used in Los Angeles Is Described**

*By Clifford A. Elliott*
Cost Engineer Pacific Electric Railway

FOR maintenance work on its tracks in paved streets the Pacific Electric Railway has used pneumatic tie tamping and pavement cutting tools for the last six years. The experience of this company indicates that the use of mechanical tools has reduced the expense of tamping and cutting by nearly half. Better results have been obtained and the life of the track has been prolonged. When working in congested streets the time saved has been an important item.

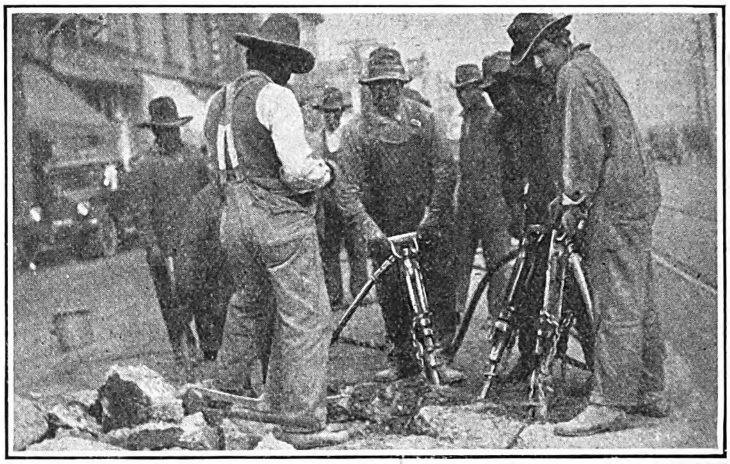
An illustration of rapid machine cutting work is furnished by a job done in January, 1924. This consisted of reconstruction of one of the company's double-track, combination-gage lines in the downtown congested district of Los Angeles, where a thirty-second car headway is operated. A total of 18,585 sq.ft. of 6-in. asphalt concrete pavement was excavated in twenty-one compressor days. It is estimated that under the handicaps connected with this job it would have required fifty working days to remove the pavement by old hand methods. Considering the traffic disturbances due to street cars and vehicles, this performance is considered very satisfactory.

When pavement was recently removed in order to lay a second track on Sixth and Front Streets (San Pedro), Los Angeles Harbor, 26,500 sq.ft. of paving was taken up in twenty-four working days. This involved 23,000 sq.ft. of 6-in. concrete base and 3-in. asphalt wearing surface, laid in 1916, and 3,500 sq.ft. of 9-in.



Three Air Compressors at Work Simultaneously in the Downtown District on Combination Gage Tracks, Where the Job Had to Be Done Without Interrupting a Thirty-second Headway

Pneumatic Paving Cutters Opening Up Pavement of 6-In. Concrete Overlaid with 3-In. Asphalt



Cutting Up a 9-In. Solid Concrete Pavement with the Pneumatic Cutters

solid concrete pavement laid in 1920. It required sixteen compressor days on the concrete base, asphalt-wearing surface type and eight days on the solid concrete type. In the case of the less solid type pavement 1,000 sq.ft. of pavement was removed in six hours. On the solid concrete job 600 sq.ft. was cut out in nine hours.

It is estimated that in general four pneumatic cutting tools can accomplish in approximately forty minutes what it formerly required four men approximately five hours to do. This naturally has an important bearing on the ultimate cost of track reconstruction. Average figures show that pavement can be removed on the Pacific Electric lines approximately 50 per cent cheaper by machine than by the old hand methods.

Based on wages paid the Mexican labor used in operating these pneumatic pavement cutting tools, the company finds that in handling emergency or small repair jobs, and using its light duty machine, the cost averages 10 to 12 cents per square foot of pavement removed and made ready for wasting. Similar work handled by old hand methods costs from 20 to 25 cents per square foot. In handling the large reconstruction track jobs, when the heavy duty machines are employed, the average cost of removing pavement is about 8½ cents per square foot. For tamping ballast in track during reconstruction the labor cost per tie is 40 per cent less than by old hand tamping methods.

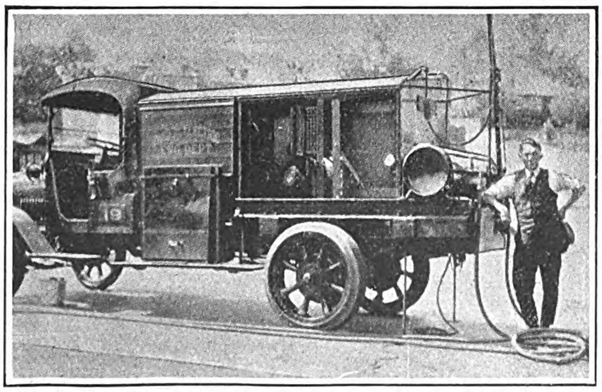
A gas-driven Ingersoll-Rand type 12x10 "ER-1" air compressor mounted on a trailer was used for the Sixth Street job. Cutting of the pavement was handled by two shifts, one nine-hour day shift and one nine-hour night shift. The average cost per square foot for the less durable type of pavement was 5 cents, while in the solid concrete type the cost averaged 16 cents per square foot. This was an unusual job because cutting is necessary only when new lines are constructed in city streets laid with solid concrete pavement. This type of pavement is not ordinarily used in and about the tracks by the Pacific Electric Railway.

The operation of the air compressor for a nine-hour working day or night shift on the above-mentioned job was arranged as follows:

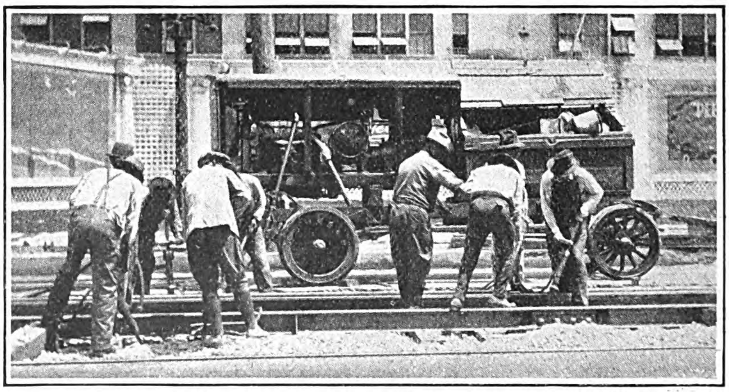
Four Mexican laborers operating cutting tools.
Two Mexican laborers as relief operators.
Two Mexican laborers as break-up or clean-up workers.
One mechanic operating air compressor.
One track foreman.
One flagman.

In organizing a paving cutting gang as outlined it has been found from experience that the laborers who operate the air guns are more efficient if they have, from time to time, a ten-minute or twenty-minute relief interval. For this reason the makeup of the paving cutting crew includes one laborer to act as relief for two air-tool operators. The relief man also handles the air hose, keeping it properly lined up or clear of traffic, for a given period of time before he takes his turn on the guns. This results in a revolving task for three laborers assigned to two air guns.

For light work the company uses an Ingersoll-Rand Imperial type four-tool, electrically driven air compressor. A direct-current 25-hp. motor operating at 500 volts furnishes the power. The air capacity is 120 cu.ft. per minute.



Supporting Rods at the Rear Steady the Truck When the Compressor Is in Operation

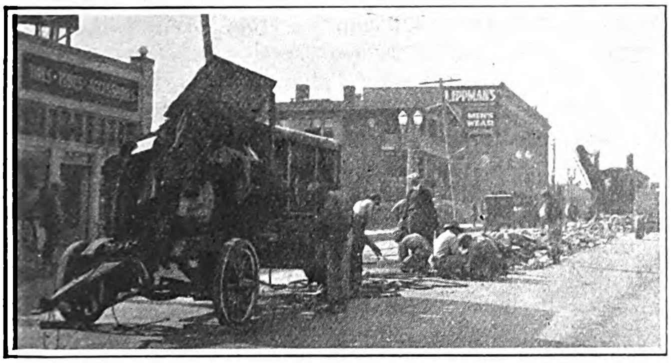


This Gas-Operated Compressor Used for Heavy Track Reconstruction Supplies Air for Eight Pneumatic Tools

This apparatus has been mounted on a 2½-ton motor truck. The layout on the truck, so far as the motor base and housing is concerned, is in accord with the Ingersoll-Rand standard mounting, but on the forward section of the truck the railway has provided tool cabinets for storing the pneumatic tools and the accessories of the machine.

Some features to improve the efficiency of the apparatus were added at the company's shop. Since the equipment is operated both day and night the truck has been wired and provided with electric lights. The current for the operation of the machine is taken from the trolley wire and a collapsible wooden pole has been designed and mounted on the rear of the truck. The pole is jointed and adjustable to any desired angle, corresponding to the distance of the machine from the track. When the pole is not in use it may be dropped to a position on the roof of the compressor. An adjustable clamp is used to connect the negative return wire to the rail. This clamp firmly secures the cable so that the vibration of passing cars will not interrupt the operation of the machine.

To reduce the vibration of the truck when the compressor is in service the rear of the body is supported from the pavement. Two 1-in. iron rods extend from the base of the chassis to steel plates 4 in. x 4 in. and 1 in. thick resting on the pavement. Round holes are drilled partly through the plates. The rods rest, therefore, in a sort of ball joint, which gives solid support to the frame. As it is always essential to have the compressor level these rods take the place of jacks. This is particularly useful when the machine is working on a narrow street where the pavement slopes sharply.



Steam Shovel Loading Broken Pavement When a Second Track Was Being Laid on Sixth Street

For large construction and reconstruction jobs in paved streets the company has also another specially constructed air compressor. It is electrically driven and takes current from the trolley. This machine has sufficient capacity for operating twelve pneumatic tools. That is, twelve tie tampers may be operated simultaneously, but only six pneumatic cutting tools may be operated at one time. If the cutting of pavement and tamping of ballast are being performed at the same time the machine will operate two cutters and four tampers. The apparatus is mounted on a trailer and hauled from place to place by motor truck.

Another machine used is a gasoline-engine-driven compressor of 60 hp., mentioned above. This requires 25 gal. of gasoline and 1 gal. of lubricant per working day of nine hours. The outfit is mounted on a trailer and its capacity is eight pneumatic air tools working continuously. No tests have yet been made to determine how many tools of different kinds can be operated simultaneously by this compressor.

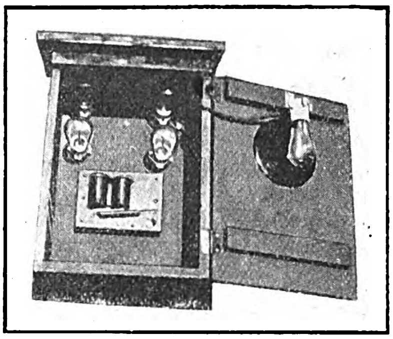
In calculating the cost of the work handled by these machines, depreciation, repairs, insurance and rental of the equipment are taken into consideration. It is estimated that the heavy duty, electrically operated compressor uses 14.92 kw.-hr. per hour. The cost of power per hour is also figured in the cost of the work where these types of machines are used.

# Signal for Special Locations

By H. J. Charters

Portland Railway, Light & Power Company, Portland, Ore.

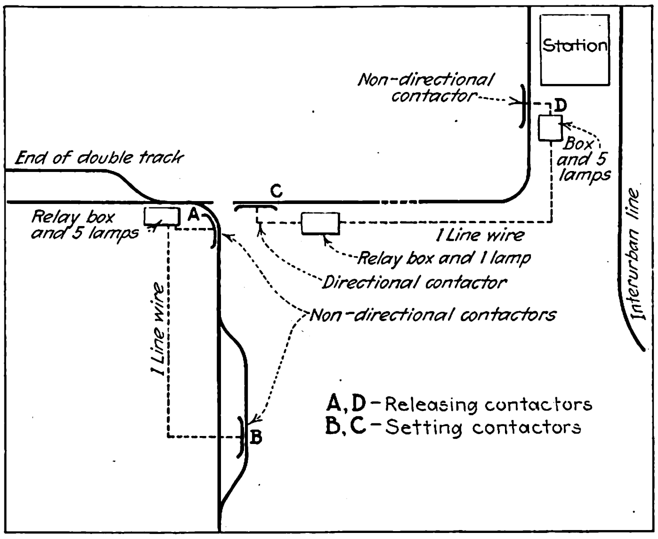
THIS company has developed a simple signal which is used for a number of purposes, such as the following: To indicate to the crew of an interurban train that a connecting city car is approaching; as a one-way block; as a terminal signal for use on the single track which extends beyond the end of a double track or beyond the last passing track on city lines. The device consists of a pick-up relay in series with five 36-watt Mazda lamps, of which one is mounted directly behind a 6⅜-in. ruby lens. This gives an indication which is visible even when on a bright day the sun is shining directly against the front of the box.



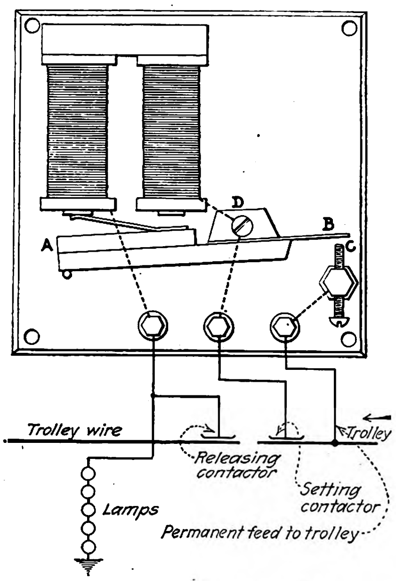
Signal and Relay Box Open for Inspection

The general principle of the relay is given in the smaller diagram showing the circuits. When a car passes under a setting contactor, a momentary current is sent through the relay winding, bringing the holding circuit into operation by closing the contact between $B$ and $C$. Current continues to flow until a car passing under a releasing contactor shunts out of circuit the relay winding, which has 50 ohms resistance, releasing the armature and opening the holding circuit. A spring between the armature and the magnet core assists the former in dropping promptly.

Applications of this signal are given in the larger diagram. In this diagram the normal limits of a one-



Track and Signal Layout Showing Two Special Applications of Portland Railway's Signal way block are indicated by the setting contactor *B* and the releasing contactor *A*. Contactor *B* is placed to provide an overlap, as indicated. A car setting the signal from *B* will travel the length of the siding before passing onto the single track. Thus, if two cars enter the block from opposite directions at the same time, the one entering from *A* will have time to come into sight of the other car around the curve before the latter car has left the siding. The car on the siding can then wait until the other one passes, avoiding possible delay by one car having to back into the clear. Another application of the signal, shown in the same diagram, is to notify interurban crews that a city car is within a distance that will justify waiting for possible passengers. A relay and signal box containing one lamp is located at *C*, this lamp being connected in series with five in the signal box at *D*, the distance between the two signals being about ½ mile. A directional contactor at *C* causes the relay to close, lighting both signals. When the car passes *D*, a releasing contactor contact is made, opening the circuit. In this case the last connecting city car at night carries signs stating that it is such, and interurban crews have instructions to call the dispatcher in case the connecting car has not appeared up to their leaving time. In connection with this signal, nondirectional brush type contactors are used in most cases, but when necessary, United States Signal Company No. 5 switches are used to give directional selection. These simple lamp circuit signals cause little trouble. Their purpose is to prevent delays incidental to cars having to back into the clear. Under these conditions the burning out of lamps does not involve dangerous operation, the speeds of the cars not being high.



Circuits of Pick-Up Relay Used in Portland, Ore.

## Pins Indicate Accident Locations

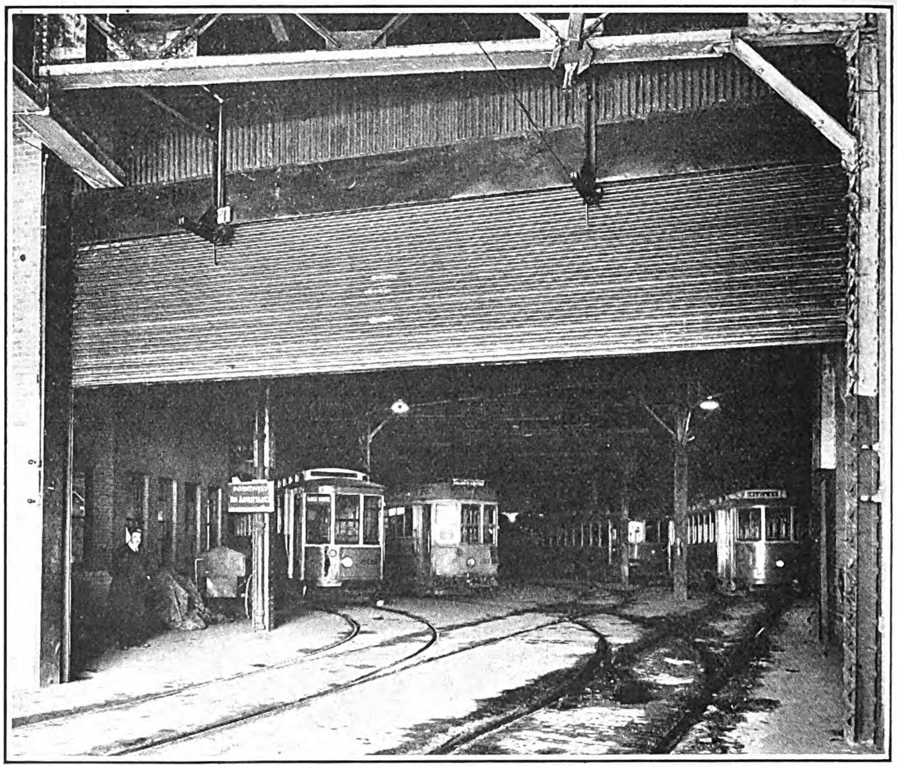
LOCATIONS of accidents on the Worcester Consolidated Street Railway are plotted for the general manager by means of colored pins stuck at the proper points on a large map showing the track layout of the entire system. Five different colored pins denote different kinds of accidents, such as automobile collisions, boarding and alighting accidents, car collisions, etc. When an accumulation of pins occurs at some point the attention of the management is drawn to the number of accidents occurring there and investigations are made with a view to remedying the situation.

## Rolling Door Worked by Electricity

A ROLLING door recently installed at the entrance to the Main Street carhouse of the Worcester Consolidated Railway, Worcester, Mass., has proved very satisfactory. The track layout of this carhouse is such that all cars enter and leave through a comparatively narrow doorway, and it is therefore possible to close it off entirely by this rolling door. The door, which was made by the Kinnear Manufacturing Company, is electrically operated. It will open or shut in fifteen seconds. Push-buttons located in the dispatcher's office alongside the doorway control the operation. The control will either open the door, shut it or stop it instantly in any position. This is important to avoid accidents.

In order to prevent cars running into the closed door, bright red electric lights have been placed on both sides of it. These go on automatically when the door is closed and warn motormen to stop. When the door begins to descend, a hinged section of the overhead contact wire drops down to allow a space for the door. When the door is rolled up to open the passageway for the cars, this hinged section snaps back in place through the action of a trip on the door.

This building is used not only as an operating carhouse but also as a repair shop. It is said that many tons of coal have been saved in the carhouse since the installation of this door last fall. The shop men working around the cars have now discarded the sheepskin coats formerly worn and the quality of the work performed has improved.



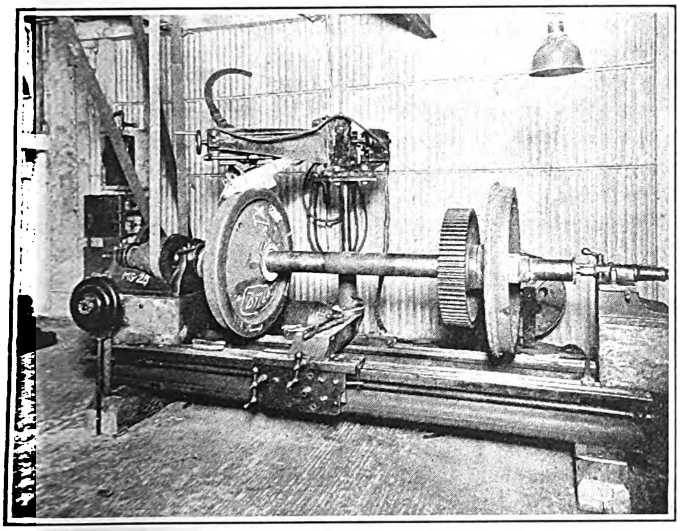
Through the Installation of This Rolling Door at the Carhouse Entrance a Considerable Saving of Coal Has Been Effected

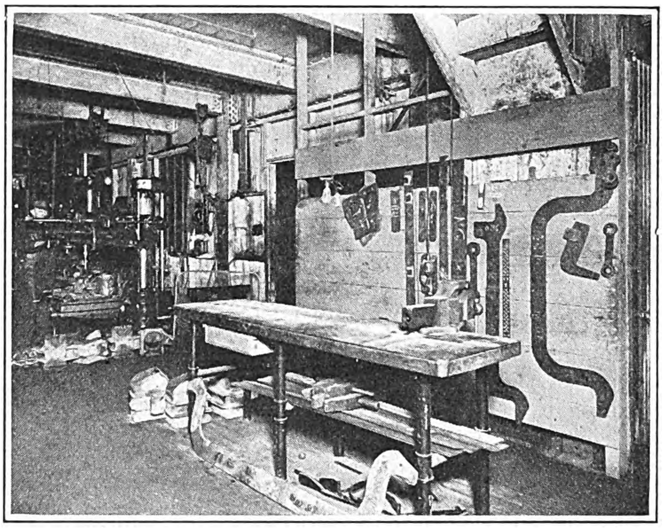
# Comprehensive Shop Welding Program Makes Big Savings

### Reclamation of Trucks, Motor Cases and Worn Steel Wheels and Axles in Shops of Springfield Street Railway and Worcester Consolidated Railway Has Materially Reduced the Waste Coincident with the Scrap Pile

BY THE installation of complete modern electric welding equipment the Springfield Street Railway and the Worcester Consolidated Railway, which are under the same management, have reduced to a small amount the quantity of material being sent to the scrap pile and have effected large financial savings. The efficiency of this reclamation program is increased by the use of American high-speed drill presses and a Lucas horizontal boring machine. The welding facilities at the Worcester shops are more elaborate than those at Springfield and much of the work is therefore done at the former place.

Rehabilitation of old trucks is accomplished in an interesting manner. The truck is entirely knocked down, wheels and axles are removed and reclaimed according to a process that is described in another paragraph of this article, motors are removed, and the armatures and fields taken out and sent to the armature room. Worn motor cases are built up by welding. The procedure in the case of an individual broken part that has to be taken out of service is similar to that employed when the entire truck is overhauled.


Flanges Are Built Up on Worn Steel Wheels at Worcester by Means of an Automatic Welder Placed on the Carriage of an Old Lathe


Templates Are Used in Marking Holes to Be Drilled in Welded Truck Parts and the Work Is Done on a High-Speed Drill

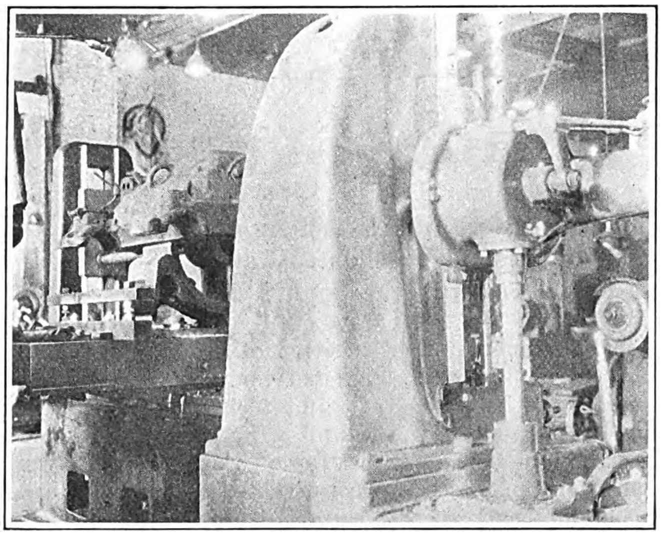
The method of reclaiming the equalizer bars of the truck is typical. These are first sent to the welding room, where all the bolt holes are completely filled in and worn parts built up by the electric welder. This process requires about two hours. They are then sent to the grinding table, where a man with a portable electric grinder smoothes them down. Fifteen minutes is required for that part of the job.

Next these pieces are taken to the marking table. Here there are steel templates for every important part of the truck frame. The templates are made with ½-in. holes in the exact position of the holes required in the truck member. Around each hole in the template is a 2-in. square of ¼-in. steel. The template is laid on the welded piece and a hand punch inserted in one of the holes. With a tap of a hammer the layout man then punches the precise center of the hole to be drilled in the piece. After the location of all holes to be drilled has been thus punched, the template is removed and the size of the hole is marked in chalk. The arrangement of templates hanging on a wall beside the layout table is shown in an accompanying illustration.

After being welded, ground down and punched the pieces are taken to the drill press. For drilling, an American high-speed drill is used. With this machine all the necessary holes in the equalizer bar of a truck frame can be drilled in ten minutes. One man operating this high-speed drill is able to do more work in less time than was formerly done by two men operating old-fashioned drill presses.

Having the various machines used in this process located in the proper relation to one another is an important factor in the efficiency of the operation. At the Worcester shops the welding room, the grinding and layout tables and the drill press are so placed that little time is lost transporting pieces from one to the other. The machines are all near together and the path of the piece under repair is continuous from one to the next.

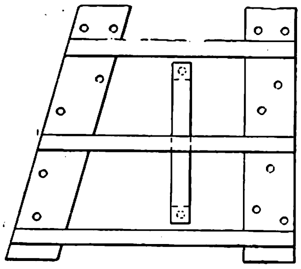
At Worcester the practice is to build up the flanges on steel wheels as fast as they wear down, until the tread of the wheel has been worn to the predetermined limit marked by a shallow cut on the wheel surface.



**A Horizontal Boring Mill Used to Drill Holes in Welded Motor Cases**

All worn steel wheels are repaired by means of an automatic welding machine. An accompanying illustration shows this machine at work. A pair of wheels mounted on the axle are set up in the bed of an old lathe. The axis of the lathe has been raised by the insertion of cast-iron blocks so that wheels of the largest size can be accommodated. The welding head is mounted on the lathe carriage, which has been equipped with ball bearings to permit easier movement. Height adjustment of the welding head to suit wheels of different sizes is easily made. By the adjustment of this head worn axles can also be built up in this machine.

The lathe is operated at a speed of one revolution in fourteen minutes by an electric motor running at 1,500 r.p.m. Gears from an old air compressor are used to accomplish this reduction in speed. It requires about eight hours to build up the flanges on a pair of steel wheels and two hours more to turn them down to the proper contour.



**This Jig Is Bolted to the Pole Pieces of a Motor Case When the Case Is Being Redrilled**

It is estimated by the company that this process adds 50,000 miles to the life of the wheel and has reduced by 30 per cent the expenditure for steel wheels. An annual saving of nearly $6,000 has been accomplished. Wheels are scrapped only after a personal inspection has been made by the master mechanic. It is now planned to reclaim many old wheels which were taken off and stored for scrapping prior to the installation of the automatic welding apparatus.

Welding is done at these shops in individual rooms specially built for the purpose. There are at present two automatic welding rooms and three for ordinary arc welding. One man, however, operates both of the automatic machines and has spare time besides. The doors of the welding rooms are heavily curtained and the insides are painted with G.E. No. 881 ultra-violet ray protective paint. An overhead trolley system with traveling chain hoists is used to transport heavy material to and from the welding rooms. It is felt that safety from eye injuries to other workmen and better quality of work by the welders result from having individual welding rooms.

Another important phase of the reclamation program being carried on by the railway is that of modernizing motor cases. In particular it was desired to convert the old type No. 101 motor cases to the more up-to-date 101-B2 type. The holes in the old cases were filled in by welding and rebored with 1¼-in. diameter instead of 1-in. as before. The old 1¼-in. hole for the armature housing was filled in and two new ones built up by bending a piece of ¼-in. iron to circular shape and filling with welding metal.

All bearing fits and housing fits were filled in and then rebored. Gear case supports were built up by welding. New fields and rewound armatures were installed where needed. This reconstruction included the elimination of the old mica brush-holder insulators and made possible the use of a more modern type of brush-holder.

Many motor cases have been reclaimed also by the Springfield Street Railway in its own shops. After the holes in the old cases had been filled with welding metal and all worn parts built up the contact surface of each half of the motor shell is carefully planed down. No equipment is available for doing this in the railway shop at Springfield, and such work is therefore sent out to a near-by machine shop.

A novel jig is used in the process of reboring these motor cases. This consists of two pieces of ¾-in. sheet steel held together by other steel cross members, as shown in the accompanying sketch. The various pieces are riveted together. Holes have been made in the heavy steel to correspond with the holes to be drilled in the case. On account of the thickness of the material used in this jig no reinforcing plate is required around these holes.

The method of procedure for this work differs materially from that employed in reclaiming truck parts at Worcester, as already described. By means of the center strip the jig is bolted firmly to the pole pieces of the motor case. The case is placed in a Lucas Precision horizontal boring machine, as shown in the illustration on this page, and the holes bored. About three cases, or one and a half motors, can be drilled in a day on this machine. More than 400 motors have already been overhauled in this way and put in good, serviceable condition.

## Ciment Fondu Proves Unsuccessful for Grout

A RECENT inspection made by the Boston Elevated Railway of paving laid on Main Street, Charlestown, Mass., and grouted with Ciment Fondu indicates that the grouting in between the blocks has disintegrated. When this paving was laid in September, 1923, the railway did not have on hand a sufficient quantity of Ciment Fondu to use it for the concrete paving base. It was, therefore, used only to cover the granite block surface.

When the grout was mixed it was bluish black in color and oily or greasy in appearance. It flowed and worked liked ordinary cement. Equal parts of cement and sand were used in the mixture. The work was completed at 3 p.m. and by 8 o'clock the following morning the pavement had the appearance of having set for three or four days. It was then firm enough to receive vehicular traffic.

An inspection was made of this paving on March 29, 1924, after it had been in service for 187 days. It was found that the grout had entirely disappeared from the face of the paving blocks and from the joints between the paving blocks to a depth varying from ½ in. to ¾ in. After the dirt which filled these joints had been removed it was found that the grout was chalky white in appearance and was easily scored with a pointed tool. It did not seem to possess the degree of hardness of ordinary portland cement grout. From the tests it would appear that this French cement is not adaptable for grout paving.

In another instance, however, the railway reports that it proved more satisfactory. A small amount was used during the construction of a sewer, where on account of the tides and the inability of the contractor to keep the ground water below the level of the manhole inverts it was impossible to use ordinary cement because every tide washed it out from the joints. A small amount of Ciment Fondu was successfully used on three of the manhole inverts because this cement sets so quickly that a fairly firm set was secured between tides.

# Compromise Joint Plates Made by Welding Shims to Angle Bars

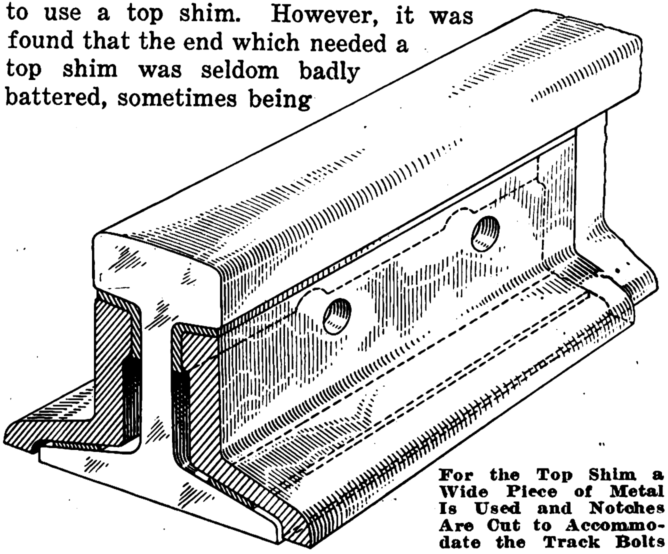
### The Great Variety of Rails Which Were Used on a Small Railway Made a Difficult Repair Problem

BECAUSE of battered joints it became necessary a short time ago to repair 3 miles of track on a small Southern railway. A miscellaneous assortment of material, including many kinds of rail, had been used in the original construction of this line, which had been sponsored by real estate men more interested in the development of a tract of land than in the construction of an electric railway. The great variety of rail sections made joint repairs a difficult problem and the method finally decided upon was the use of compromise joint plates made by welding shims to angle bars.

Although approximately four out of five of the joints were composed of rails of different sizes, and a great improvement could have been effected by taking up, sorting out and relaying the rails, it was felt that such a method would be too expensive. So many kinds of compromise joints had to be made that it was out of the question to buy angle bars to fit. Moreover, it was found virtually impossible to weld such bars satisfactorily to the rail. In many cases on low T-rail, and in all cases where the bar was too small for the rail, the top edge of the angle bar was hidden beneath the ball of the rail. The plan of turning the angle bars bottom side up and welding them in that position was thought to be unsatisfactory, because the fit was likely to be very poor with such a great variety of rails in use. To take up the rails and cut off the worn ends would have been very expensive. Moreover, with so many different sized rails in use, satisfactory joints could not have been made after the rail ends were cut off. But by using the rail in the same length as it was originally made and bringing the joints even by the use of shims a smooth running surface was attained at moderate cost.

In order to make the joints tight in repairing these 3 miles of bad track, shims of various sizes were used on top of or underneath the angle bars, or sometimes at both the top and also the bottom. The material used varies in thickness from 1/16 to 3/16 in., and in width from 1¼ to 1½ in. The top shim was welded to the angle bar after the joints had been made up, except in cases where the shim was wide enough to reach down on the inside and be held in place by the track bolts. In that case openings were cut in the edge of the shim the same distance apart as the bolt holes, as shown in the accompanying illustration, and after the bolts were in place no movement of the shims was possible. The lower shim usually was welded either to the underside of the angle bar or to the base of the rail. Long shims used on the bottom were sometimes not welded but were cut about 4 in. longer than the angle bar and the ends bent over after the joint had been made up. In this way they were prevented from working out endways when the track bolts loosened.

At first thought it might be considered better practice to build up the head of the rail by welding rather than to use a top shim. However, it was found that the end which needed a top shim was seldom badly battered, sometimes being entirely uninjured. There was often a difference of 3/16 in. in the thickness of the balls of adjacent rails. It was therefore decided to bring the rails into line by the use of shims rather than by extensive welding. In some instances the use of a top shim was avoided by cutting down a large angle bar to exact size with a blow torch.



**For the Top Shim a Wide Piece of Metal Is Used and Notches Are Cut to Accommodate the Track Bolts**

On open joints the welding was usually done during the heat of the day, the angle bars being left loose until the joint closed up. A week or so later the joints were tightened again. Special attention was given to hammering the weld during the application of the metal, thus hardening it and giving a better running surface.

Where the angle bars were worn only on the top in the center, welding metal was added to correct this defect before the bar was used, so that the finished joint would have no tendency to sag.

Joints repaired by this method five years ago have remained in good condition on open track with the bolts being tightened only three times. It was expected when this work was originally undertaken that it would be at best only a makeshift job. Accordingly, only the worst battered joints were built up with the electric welder, because the company had no grinder, but as the work progressed, the results were much more satisfactory than could have been anticipated. The car wheels make but slight noise in passing over these joints, and the cars ride very smoothly. The use of this method has been extended, and the cost of fixing joints is less than it would be for labor alone to take up and re-lay the rail.

# Commercial and Research Department Feature Pittsburgh Organization

### A Distinct Sales Organization with Executive Powers Has Been Formed to Cover Fares, Service and Relations with the Patrons—Research Department Will Be Source of Data for All Other Departments

ON FEB. 1, 1924, the receivers of the Pittsburgh Railways were discharged, the property was returned to the Philadelphia Company and the railway reorganized along lines that would make it correspond more closely to a truly commercial organization of modern type. The two features of immediate import are the new commercial and research departments, the first to sell the goods ordered from the transportation department and the second to serve as the data reservoir of the company at large. The commercial department will be broader in scope than the pioneer American one of the Chicago Rapid Transit Company, while the research department is practically new in American electric railway organization.

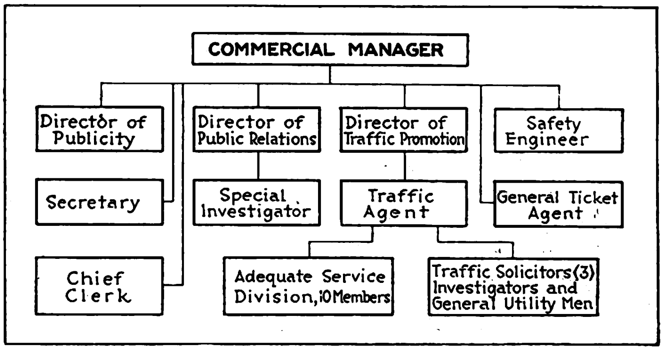
These changes are in accord with the ideas of Thomas Fitzgerald, general manager, who has long been on record as a believer in the doctrine that the words "public service" as applied to a railway mean the serving of the public to the utmost degree consistent with financial stability. This doctrine he put into specific form some four years ago (see ELECTRIC RAILWAY JOURNAL, May 15, 1920) when he suggested that the correct basis for rewarding a mass transportation concern is to pay it a profit in proportion to its popularity as a common carrier. The commercial department is the tool for making this modern conception of service effective.

## W. H. BOYCE COMMERCIAL MANAGER

No understanding of the commercial department would be complete without some sketch of the experience of the personnel. W. H. Boyce, commercial manager, is no stranger to the industry. For many years he was general manager of the Beaver Valley Traction Company, also a subsidiary of the Philadelphia Company. His work in the Beaver Valley in public relations, in safety pioneering and in fares is nationally known. Few managers have so largely enjoyed the confidence of regulatory bodies. One marvels at the celerity with which changes in rates have been granted to the Beaver Valley Traction Company, no matter how novel the kind of fare was at the time. Short-haul fares, weekly passes, emergency ticket rates, off-peak reductions on special days have been granted practically over night because of the commission's experience that the applicant had at heart both the public and the investor's interest. This background is already proving invaluable in the larger sphere of the Greater Pittsburgh district.

As detailed on the "Personal Items" page of the April 5 issue, the commercial manager is assisted by a staff of men who are already familiar in detail with the Pittsburgh system. F. R. Cogswell comes by the place of director of traffic promotion through his intimate knowledge of Pittsburgh routes and travel habits. J. B. Donley, director of public relations, knows the press and the various city departments, whose cooperation is so desirable, as only a native can. C. C. Gillette as traffic agent supplements Mr. Cogswell in this wise:

Cogswell says that there is business to be obtained at such and such a time over such and such a route provided the transportation department has the men and cars available. Whereupon it is Gillette's part to determine whether suitable facilities can be provided by the transportation department, whether sufficient power is available, whether freight will not interfere, etc. From this it will be seen that the commercial department acts precisely like the sales organization of a private concern, sales and manufacturing functions being entirely distinct.


COMMERCIAL MANAGER
Director of Publicity
Director of Public Relations
Director of Traffic Promotion
Safety Engineer
Secretary
Special Investigator
Traffic Agent
General Ticket Agent
Chief Clerk
Adequate Service Division, 10 Members
Traffic Solicitors (3) Investigators and General Utility Men

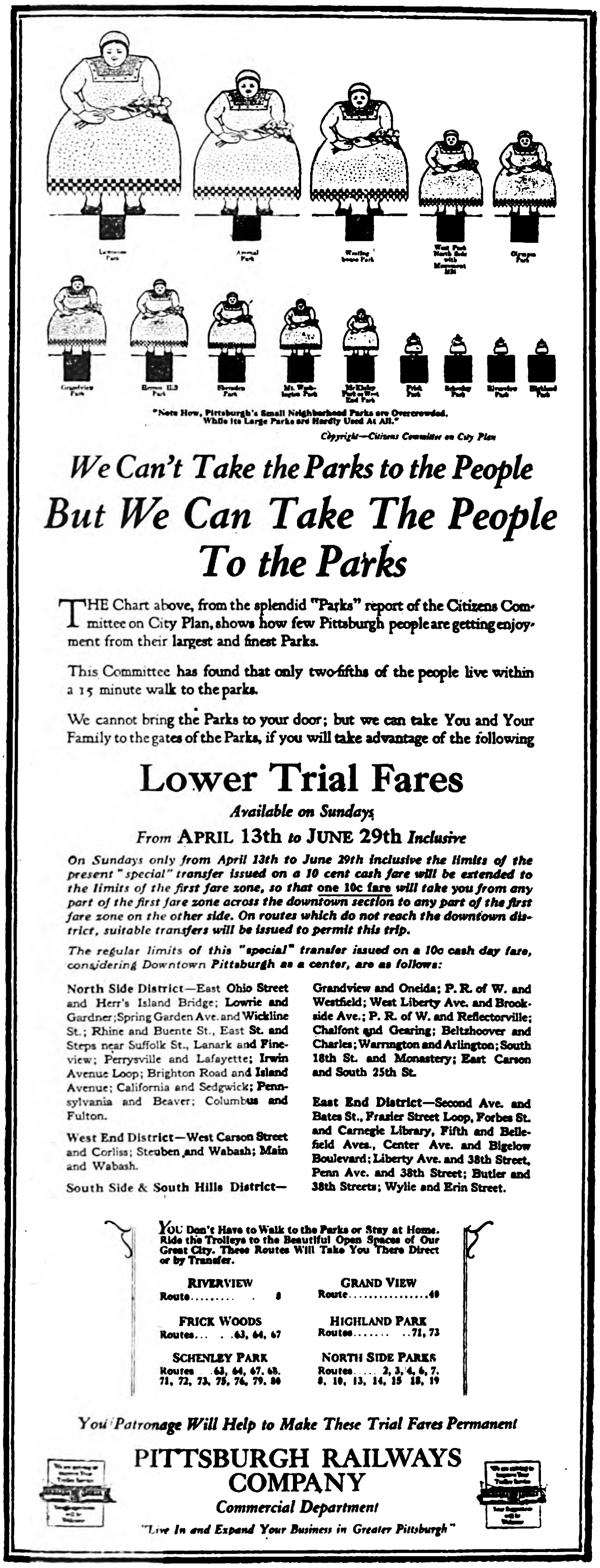
Organization Chart of the Pittsburgh Railways Commercial Department

Other commercial department duties disclosed in the organization chart reproduced herewith are those relative to adequate service, traffic solicitation and investigation. J. E. Davis, as chief of complaint adjustment work with the title of special investigator, has put this work on a much higher plane than hitherto, as may be guessed from reading the details of his formal and professional education.

In addition to the general ticket agent, W. G. Stern, the commercial department will soon be expanded in certain other directions, close to public relations work, as will be revealed in due time.

## CONSTRUCTIVE WORK DONE FROM THE START

For several years preceding the reorganization, Arthur W. Thompson, president, had spoken before numberless civic bodies on the now effective traction agreement that would make the Greater Pittsburgh municipalities a real partner and co-manager in the enterprise of mass transportation. Through this work the general public attained a high degree of understanding and interest in the traction problem. It follows that when the new management took hold the public expected to see some tangible proofs of the company's sincerity. New cars were ordered and other improvements begun as had been promised, but naturally enough there was a keen desire for immediate action in regard to fares and service conditions.



"Note How, Pittsburgh's Small Neighborhood Parks are Overcrowded, While its Large Parks are Hardly Used At All."

*Copyright—Citizens Committee on City Plan*

*We Can't Take the Parks to the People*

*But We Can Take The People To the Parks*

THE Chart above, from the splendid "Parks" report of the Citizens Committee on City Plan, shows how few Pittsburgh people are getting enjoyment from their largest and finest Parks.

This Committee has found that only two-fifths of the people live within a 15 minute walk to the parks.

We cannot bring the Parks to your door; but we can take You and Your Family to the gates of the Parks, if you will take advantage of the following

**Lower Trial Fares**

*Available on Sundays*

*From* **APRIL 13th** *to* **JUNE 29th** *Inclusive*

***On Sundays only from April 13th to June 29th inclusive the limits of the present "special" transfer issued on a 10 cent cash fare will be extended to the limits of the first fare zone, so that one 10c fare will take you from any part of the first fare zone across the downtown section to any part of the first fare zone on the other side. On routes which do not reach the downtown district, suitable transfers will be issued to permit this trip.***

*The regular limits of this "special" transfer issued on a 10c cash day fare, considering Downtown Pittsburgh as a center, are as follows:*

North Side District—East Ohio Street and Herr's Island Bridge; Lowrie and Gardner; Spring Garden Ave. and Wickline St.; Rhine and Buente St., East St. and Steps near Suffolk St., Lanark and Fineview; Perrysville and Lafayette; Irwin Avenue Loop; Brighton Road and Island Avenue; California and Sedgwick; Pennsylvania and Beaver; Columbus and Fulton.

West End District—West Carson Street and Corliss; Steuben and Wabash; Main and Wabash.

South Side & South Hills District—Grandview and Oneida; P. R. of W. and Westfield; West Liberty Ave. and Brookside Ave.; P. R. of W. and Reflectorville; Chalfont and Gearing; Beltzhoover and Charles; Warrington and Arlington; South 18th St. and Monastery; East Carson and South 25th St.

East End District—Second Ave. and Bates St., Frazier Street Loop, Forbes St. and Carnegie Library, Fifth and Bellefield Aves., Center Ave. and Bigelow Boulevard; Liberty Ave. and 38th Street, Penn Ave. and 38th Street; Butler and 38th Streets; Wylie and Erin Street.

**YOU Don't Have to Walk to the Parks or Stay at Home. Ride the Trolleys to the Beautiful Open Spaces of Our Great City. These Routes Will Take You There Direct or by Transfer.**

RIVERVIEW
Route .......... 8

GRAND VIEW
Route .......... 40

FRICK WOODS
Routes .......... 63, 64, 67

HIGHLAND PARK
Routes .......... 71, 73

SCHENLEY PARK
Routes .......... 63, 64, 67, 68, 71, 72, 73, 75, 76, 79, 80

NORTH SIDE PARKS
Routes .......... 2, 3, 4, 6, 7, 8, 10, 13, 14, 15, 18, 19

*Your Patronage Will Help to Make These Trial Fares Permanent*

PITTSBURGH RAILWAYS
COMPANY
*Commercial Department*
*"Live In and Expand Your Business in Greater Pittsburgh"*

Announcement of Special Sunday Fares to Take People to the Parks

In appreciation of this feeling, the commercial department has been inaugurating various forms of relief as rapidly as the condition in each case can be analyzed and the necessary material aids (such as the printing of new transfers) arranged. The transfer situation has been especially complicated because of the topography of Greater Pittsburgh, intercompany relations and the necessity of dealing with a very large number of political units ranging from Pittsburgh City, with more than 600,000, to boroughs with only a few hundred inhabitants.

One of the first jobs, therefore, has been to liberalize the transfer situation so that there would be more consistency in the privileges granted both ways and to remove various inequalities that gave residents of one area much less freedom than their neighbors. As it would be a futile task to describe these transfer reliefs in detail, it will suffice to say that several score have already been granted. Each additional privilege has brought many hundreds of persons into a friendlier state of mind toward the company and produced a willingness to be forbearing as regards other changes that will require more time and involve greater revenue.

It may be remarked in passing that some of the transfer reliefs are of the sort on which it is possible to double back. This does not cause the commercial department any deep concern, as both the traffic records and common sense indicate that the preponderant majority of the riders have no interest whatever in doubling back. In other words, the management does not wish to disoblige 100 legitimate users of a transfer because of five illegitimate users; neither does it believe that it pays to set two transfer checking watchmen for every transfer misuser.

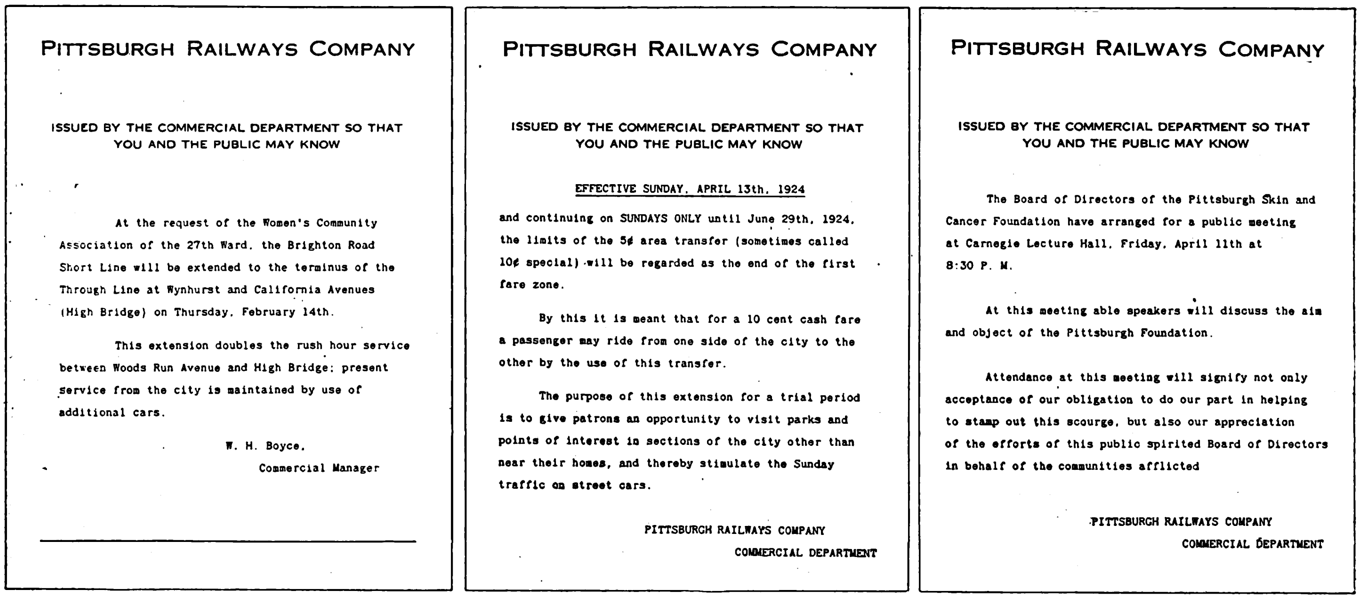
At any rate, the revenue returns so far do not show that the finances of the company have been impaired by restoring privileges of pre-war days. Few passengers were paying an extra fare, since most persons had adjusted themselves more or less willingly to the more stressful conditions.

Another step that has been accepted as evidence of good will is the readjustment of certain zone limits. In the case of a Carnegie line, a new transfer privilege has cut down the charge to Pittsburgh by a full one-zone fare. At McKeesport, a zone limit was extended to bring riders directly into the heart of the business and amusement center. The old limit did not force an extra fare from the riders, but did cause them considerable annoyance in bad weather or when laden with shopping bundles. Likewise, other zone boundaries have been shifted so that the limits would come at natural traffic points. In these and other fare studies the department has been aided by Walter Jackson as consultant.

A scanning of the passenger regulations showed some that could be placed on a "dealer and customer" rather than a monopoly footing. The basic token fare of $8\frac{1}{3}$ cents is sold three for 25 cents. It may happen, sometimes, that a patron brings two others along and wishes to pay for all three without the extra motions of handing a quarter to the conductor, getting three tokens back and then dropping them into the box with due ceremony. The direct action of dropping the quarter into the box is now permissible, the customer's convenience being held superior to a microscopic accounting error in the relative number of 10-cent cash and $8\frac{1}{3}$-cent token riders.

A more common occurrence is the absent-minded passenger who drops too much money in the box. In this instance the management feels that its conductors certainly can be trusted a half dollar's worth anyway; hence the new regulation that conductors may refund at once any excess up to and including 50 cents. The only stipulation is that they turn in the forgetful customer's name and address.

Mr. Boyce had gratifying success with this plan on the Beaver Valley. The daily Pittsburgh records show that the new rule is much appreciated by conductors as well as riders. It goes without saying, also, that the passenger is glad to get his money at once without being expected to visit the railway office.



Pittsburgh Railways Company

ISSUED BY THE COMMERCIAL DEPARTMENT SO THAT
YOU AND THE PUBLIC MAY KNOW

At the request of the Women's Community Association of the 27th Ward, the Brighton Road Short Line will be extended to the terminus of the Through Line at Wynhurst and California Avenues (High Bridge) on Thursday, February 14th.

This extension doubles the rush hour service between Woods Run Avenue and High Bridge; present service from the city is maintained by use of additional cars.

W. H. Boyce,
Commercial Manager

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Pittsburgh Railways Company

ISSUED BY THE COMMERCIAL DEPARTMENT SO THAT
YOU AND THE PUBLIC MAY KNOW

EFFECTIVE SUNDAY, APRIL 13th, 1924

and continuing on SUNDAYS ONLY until June 29th, 1924, the limits of the 5¢ area transfer (sometimes called 10¢ special) will be regarded as the end of the first fare zone.

By this it is meant that for a 10 cent cash fare a passenger may ride from one side of the city to the other by the use of this transfer.

The purpose of this extension for a trial period is to give patrons an opportunity to visit parks and points of interest in sections of the city other than near their homes, and thereby stimulate the Sunday traffic on street cars.

PITTSBURGH RAILWAYS COMPANY
COMMERCIAL DEPARTMENT

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Pittsburgh Railways Company

ISSUED BY THE COMMERCIAL DEPARTMENT SO THAT
YOU AND THE PUBLIC MAY KNOW

The Board of Directors of the Pittsburgh Skin and Cancer Foundation have arranged for a public meeting at Carnegie Lecture Hall, Friday, April 11th at 8:30 P. M.

At this meeting able speakers will discuss the aim and object of the Pittsburgh Foundation.

Attendance at this meeting will signify not only acceptance of our obligation to do our part in helping to stamp out this scourge, but also our appreciation of the efforts of this public spirited Board of Directors in behalf of the communities afflicted

PITTSBURGH RAILWAYS COMPANY
COMMERCIAL DEPARTMENT

**Three Samples of the "Blue Letters" Issued to Employees of the Various Pittsburgh Subsidiaries of the Philadelphia Company**

### SPECIAL INTERURBAN THEATER AND PITTSBURGH SUNDAY FARES

Two other instances of early constructive work on the part of the commercial department are the reduced fares put on for interurban and city riders during slack periods.

On the two interurban lines round-trip theater-time tickets are being sold at one and one-third times the one-way rate, provided the inbound trip is started at approximately 6:30 p.m. from the farther stations and return is made the same night. So far the desired publicity and personal co-operation with Pittsburgh theater interests has not been worked out to obtain full benefits from these tickets, but in the meantime the patrons of these lines have something pleasant to say about the "commercial department," whose title appears on all announcements of the character described.

Beginning April 13 the company is trying a "Sunday only" liberalization of the 10-cent crosstown fare. Ordinarily, this special transfer is good within a rather restricted distance on each side of Pittsburgh center. The Sunday rate carries the user all the way up to the limit of the one-fare zone if so desired. This rate will be in effect on all Sundays to June 29, inclusive. It is hoped that riding to the parks, to the churches and to family reunions will be especially stimulated. Sunday traffic in Pittsburgh is so far below everyday riding that a trial of this kind is quite logical.

As for the probable popularity of the Sunday reduction, one instance is of interest. A woman called up the commercial department to make sure that the 10-cent special really would enable her to reach a favorite church on the other side of town. She was delighted to learn that the 10-cent fare would cover the trip and added that this meant three companions as well. The oddest part of the story is that the limits of the week-day 10-cent special actually were liberal enough to make the same trip any day, but owing to absence of publicity she did not know this to be the case. As regards the Sunday innovation, the people of Pittsburgh have not been left in doubt, for the company ran half pages in the dailies for three days before the new privilege became effective. This particular advertisement stressed Sunday travel to the parks, but in other seasons the emphasis will be on travel to indoor entertainments or other edification.

### "SO THAT YOU AND THE PUBLIC MAY KNOW"

Not the least interesting example of the commercial department spirit is the style in which the different regulations are placarded and otherwise made known. Every effort is made to get away from the unconsciously arbitrary wording of so many railway announcements. A feature in harmony with President Thompson's policy on the other subsidiaries of the Philadelphia Company in Pittsburgh is the broadcasting of a "blue letter" from the commercial department to the officers and petty officers of the affiliated companies, aside from the railway circulation of the same letter. The purpose of this outside circulation is to help these hundreds of men to give a satisfying answer to the inquiry of friend, neighbor or stranger on these changes.

An important point about the "blue letters" is that credit is given to the customers for changes in regulations. Some of these blue letters are reproduced herewith, omitting a small picture of a street car which is printed on the blue letter just under the company name. In this simple way it is brought home to the man who reads the letter, whether at home or on the carhouse bulletin board, that the management is not above accepting suggestions from its customers and its employees and that when such suggestions are found acceptable due acknowledgment will be made.

### HOW PRESS AND PUBLIC SHOW APPROVAL

Up to the present the transfer reliefs seem to have made the strongest impression on the public at large. An editorial approval was one of the first signs, and this has been reinforced by many letters, telephone calls and personal visits from individuals. It is remarkable, also, how large a proportion of the comments that reach the department in these several ways is of a constructive nature. Very few demand an immediate return to a 5-cent fare and the additional ideal of a seat for every passenger every time. The average person is shown to have a pretty clear grasp of the company's financial problems as a whole. If he suggests a transfer here or a lower fare there it is generally with an argument that his personal observation indicates that the company would make more money thereby. He has got over the idea that more money isn't a necessity.

Many of these suggestions are being considered carefully, for it is realized that the person who travels a given territory day after day has a viewpoint that may escape the professional operator. In any event, the collective wisdom of the riders and of the platform men is worth seeking and trying.

It is true that none of the innovations hitherto made affects the majority of the riders. They are but the forerunners of bigger and better events. For such greater changes it is necessary to build up a foundation of public confidence. This is just what is being achieved. Each change or experiment is along the line of the public's desires. The change may not be important enough in itself to show a tangible financial result up or down, but it makes a new group of friends in a new part of the territory.

Nor are these friends being made only through the changes described. The handling of complaints by personal calls from men of culture and refined address and the department's courteous request that telephone complainants give their name and address to permit the immediate mailing of refund tokens are policies bound to have a happy cumulative effect. Many persons are satisfied to turn in a complaint and let it go at that. Laborers and other patrons of limited means are exceptionally pleased when they find an investigator calling in person because adjustment by telephone or letter was not practicable.

### RESEARCH DEPARTMENT TO BE GENERAL DATA SOURCE

The research department, now being organized, with A. C. Spurr as research manager and A. H. Leschke as research engineer, as yet is not quite so advanced in staff and scope as the commercial department. Hence, a full description of its work is impossible. The general plan is that this department shall serve as a study and statistical organization for the other departments of the company. For example, as motor-bus operation is a live topic, this department is gathering all pertinent data for submission to the motor-bus committee so that the latter can get at the subject without using time in digging for details. Such information is gathered partly from the printed page, partly by correspondence and partly by direct visits. A feature emphasized by Mr. Fitzgerald is that this department will have many opportunities to relieve the different departments of the disturbance of routine that arises when some particular report must be prepared in a hurry. Instead of pulling men away from their daily jobs, the required material can be requested from the specialists who know just where to look for the facts—whether outside or inside the company—and how to put them together to greatest advantage. Such a central bureau in the course of the year will save a great deal of repetition of labor.

The relationship of the research to, say, the commercial department can be illustrated by just one item. The research department and not a clipping bureau reads the local newspapers that come to the office. Therefore, they are read with intelligence and between the lines. In this way the commercial department will be kept apprised of developments in building, in future exhibits, conventions, etc., and all other items that will assist the creation and increase of riding travel at a profit to company and community alike.

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## Benefits of the Hospital Association Are Extended

PLANS extending the benefits and activities of the Illinois Traction System Hospital Association to all the properties of the Illinois Power & Light Corporation have been completed by trustees of the organization. The name of the Illinois Traction System Hospital Association has been changed to Illinois Power & Light Hospital Association.

The Illinois Traction System Hospital Association was organized in July, 1907, by employees of the Illinois Traction System, now one of the properties of the Illinois Power & Light Corporation. It was formed for the hospital care and treatment of employees of the big interurban system, the workers paying each month a small assessment for dues. Deficits were made up by the company.

In July, 1910, it was decided to extend the scope of the hospital association's activities by adding death benefit and total disability features.

The employees who were members of the hospital association were eligible to join the fund providing they passed the required examination.

The first assessment or dues for employee members amounted to $536, but the Illinois Traction and its subsidiaries added to the fund and made it possible to pay $800 for the first death in July, 1910.

The management then announced that as soon as the dues or assessments amounted to $800 it would make up the difference and make it possible to pay $1,000. The first $1,000 was paid in June, 1913. The death benefit and total disability fund has been paying $1,000 for death or total disability from that time to date as the assessments or dues amount to more than $800 each month.

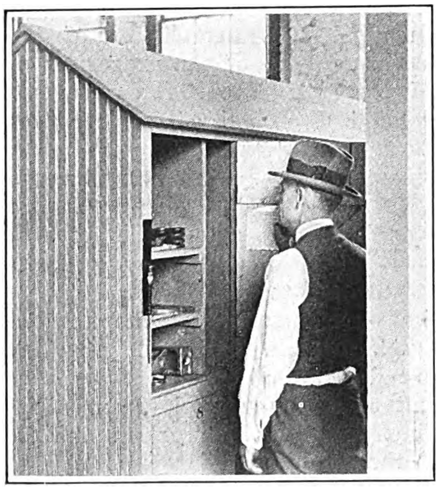
The assessments and dues for the hospital association as well as the death benefit and total disability fund are based on the monthly wages of each employee. Therefore, each contributes to this fund according to the amount of wages he receives, the higher salaried man, of course, paying the larger amount, but all receiving equal benefits.

To make all of this possible the Illinois Traction and its subsidiaries, since the beginning of the association, have contributed more than $80,000.

# Equipment Maintenance Notes

## Saving Expense of Night Storekeeper

IN THE shops of the carhouses of the Los Angeles Railway a system is in use which makes it unnecessary for each night mechanic to draw his necessary supplies from the storeroom. This saves the expense of a night storekeeper's salary. Each night mechanic has a separate locker and is assigned to definite work. For example, one man may have charge of a certain amount of brake repair. His locker is then kept supplied with material necessary in his work. A card form is kept in a holder inside the locker door and the mechanic notes on this card the materials he uses. Next morning the day storekeeper makes the rounds of the lockers and replaces the articles which the card shows were used on the previous night. The storekeeper removes the card for his records and places a new blank in the holder.



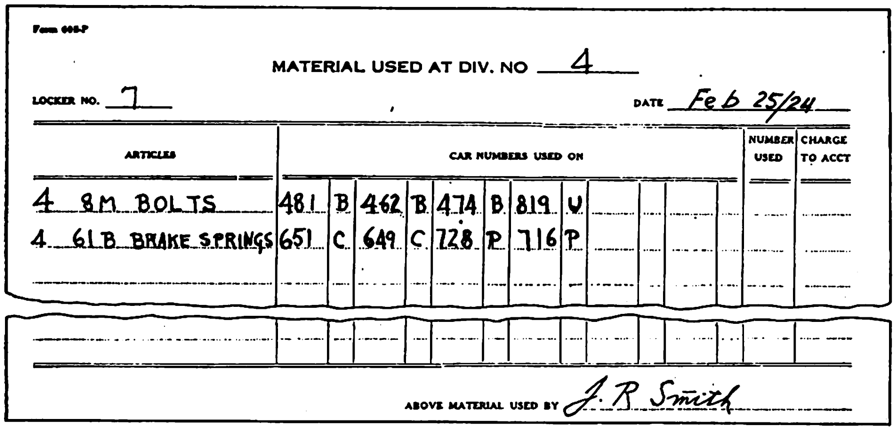
Lockers Where Night Mechanics Keep Materials for Their Work

## Forming Controller Tips on Power Punch

AT THE Harvard shops of the Cleveland Railway use is made of a 200,000-lb. power punch to cut and form the burning tips used on controllers. The dies and fixtures are so arranged that it is possible to cut the tips with the proper bevel at the ends. After a sufficient number are cut, a curved piece is inserted in the die, which forms the individual piece to the proper curvature and at the same time offsets the end which fits under the controller segment.

On the base of the punch is mounted a grooved die into which the cutting and forming die fits. The rear portions of these dies are used for the "cutting off" operation, the copper bar being held in the proper position by two guides mounted on the base of the punch and by an elongated floor rest at some distance from the machine. In this operation it is necessary to turn the material over after each cut in order to give the proper bevel to each end of the tip.

For the curving and offsetting operation a concave die with a shoulder is fitted in the slot in the die holder attached to the base of the punch, while a convex die is fastened to the punch head. The tips are placed on the concave die and are formed and offset by the pressure applied by the punch.



Form 608-P

MATERIAL USED AT DIV. NO 4

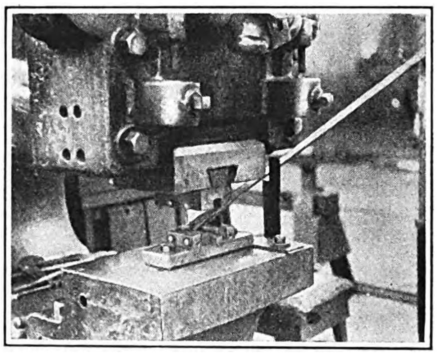
LOCKER NO. 7

DATE Feb 25/24

| ARTICLES | CAR NUMBERS USED ON | | | | | | | | | | | | NUMBER USED | CHARGE TO ACCT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 8M BOLTS | 481 | B | 462 | B | 474 | B | 819 | U | | | | | | |
| 4 61B BRAKE SPRINGS | 651 | C | 649 | C | 728 | P | 716 | P | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

ABOVE MATERIAL USED BY J. R. Smith

Card Used to Inform Day Storekeeper What Supplies Were Used the Previous Night

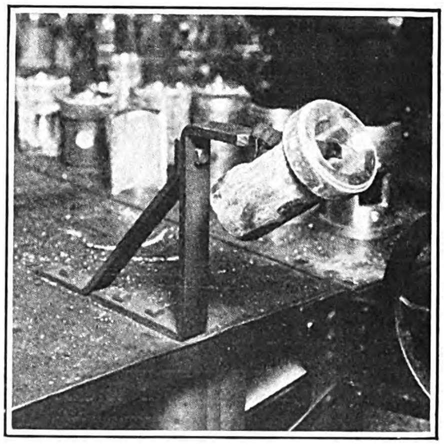


Cutting Controller Burning Tips on 50-Ton Mechanical Punch; 3,000 Are Cut and Formed in 12 Hours

With this adaptation it is possible for one man to finish 3,000 controller tips in 12 hours. Formerly the offsetting operation was accomplished on a milling machine, on which only 75 of the tips were finished in the same time.

## Testing Bearings for Loose Babbitt

A COMMON method of determining whether the babbitt lining of bearing shells is adhering properly is to suspend the shell and strike it a sharp blow. When bearings are well babbitted a clear metallic tone will result. The quality and clearness of the tone depend to a considerable extent on the method of suspending the bearing.



Armature Bearing in Position for Testing for Loose Babbitt on Brooklyn-Manhattan Transit System

In order that uniform results may be secured when testing

# Dick Prescott Hears Half a Conversation

## And a Visitor "Listens In"

"MR. MULLANEY, we're not going to be able to get that car ready for the transportation department today," said Steve White over the telephone in answer to the gruff inquiry from Thomas Mullaney, the general foreman of the Consolidated's shop.

The carpenter foreman's tone was not apologetic. In fact, it was just a little belligerent, and there was evidence of exasperation in the expression on his face. Steve's tone and expression made Dick Prescott feel uncomfortable, but they had been talking when the telephone bell rang and Dick therefore remained standing in the carpenter shop office.

So tense was the situation that neither he nor Steve was aware of the presence of the rather reserved looking gentleman who stopped in the doorway as though to ask a question, and remained waiting for Steve to finish talking. Neither Dick nor the second listener could hear the other end of the conversation, but that emanating from the little office was extremely significant.

"Yes, Mr. Mullaney, I know you said you wanted that car out today, and we did all we could to get it out, but one of the boys made a mistake in getting a piece of work done in the mill." . . .

"That's true, there's been a lot of mistakes made, but part of them have been due to the hit-and-miss way we're trying to do our work." . . .

"You bet I do, Mr. Mullaney, and I'm not the fellow that's trying to pass the buck. I know I'm responsible for what goes on over here, but I've got to have some help in the office or I can't do a bit better than I've done. I'm getting to the place where I'm ready to throw up my hands." . . .

"No, I don't want to do that, Mr. Mullaney, but I can't stay here much longer and keep on taking the responsibility for slips when I know the trouble is not with me." . . .

"I think I do watch things as closely as I possibly can under these conditions, but one man can follow only so much, and some of these things are bound to go wrong unless we get a little more system for handling our work." . . .

"Not at all! I don't want to load the shop up with any more red tape than necessary, but we'd save a lot of worry and mistakes if we planned our work a little ahead." . . .

"That's all true, Mr. Mullaney, but conditions are a lot different than they were 30 years ago, and unless we make some improvements we're going to keep on having trouble. If you'll notice, the transportation department isn't doing things like it did 30 years ago. All this talk about selling transportation, and these new ads they're running in the papers about giving service and calling the car riders customers and all that stuff, are a lot different than 30 years ago. That's one of the things that's giving us trouble. The transportation department is trying to keep all the cars it can in service and we don't have as many in the shop as we used to. That's why we've got to change our methods to keep up with the new conditions, or we're going to keep on having the same troubles we've been having right along." . . .

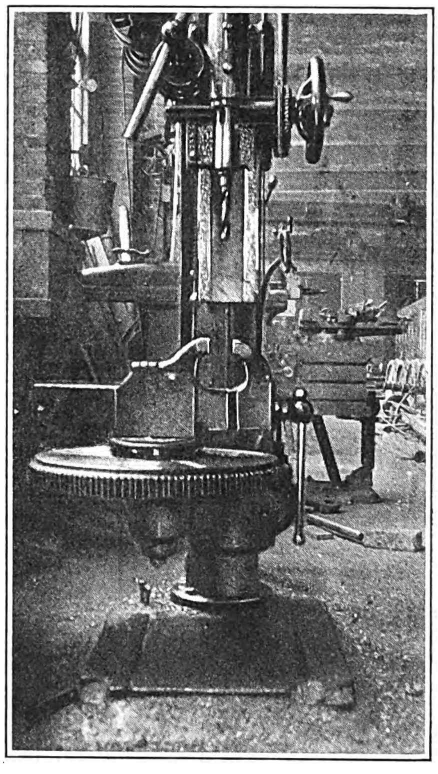
"Sure I will. I'm glad to hop to it and do all I can. In the meantime, I'll kind of lay out what I think we ought to do in the carpenter shop and mill. I've been thinking a lot about these old machines over here ever since we got up that dope for the ELECTRIC RAILWAY JOURNAL the other day, and I think we could speed up a lot and save our costs by putting in a few new machines and replacing some of these old types. I'll get my figures together and be ready whenever you want to call a meeting."

Steve White hung up the receiver, heaved a sigh of relief, and then on swinging around in his chair, noticed for the first time the gentleman who stood in the doorway, showing no outward evidence of the effect of the statements he had just heard.

bearings in this manner a special bracket has been arranged on a bench in the babbitting department of the East New York repair shops of the Brooklyn-Manhattan Transit System, on which the bearings are placed. The accompanying illustration shows an armature bearing in position for testing. The end of the bracket is rounded and is covered with several layers of canvas. With this method of suspending the bearing uniform results are obtained.

## Vise Handy on Drill Table

MANY small parts are drilled in an electric railway shop, and if each one has to be clamped in position for drilling considerable time is taken. As a result it is quite common practice for the operator to hold the piece on a block with his hand while drilling. This, however, sometimes leads to accidents and is tiring to the operator where a considerable amount of drilling is done.

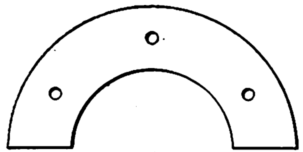


Vise Mounted on Table of Drill Press in Shops of the Philadelphia & West Chester Company

A vise mounted on the table of the drill press is found to be a great time saver in the shops of the Philadelphia & West Chester Traction Company, Upper Darby, Pa. The vise is bolted to the center of the table so that it can be rotated independently and also can be moved as the table is swung about. This enables it to be placed in any position convenient for drilling and small parts can be clamped in the vise and held firmly in an instant. More accurate drilling also results.

## Cast-Iron Axle Collars Replace Fiber

THE Worcester Consolidated Street Railway, Worcester, Mass., has tried the experiment of substituting a cast-iron piece ⅝ in. thick, shaped as shown in the accompanying sketch, as a substitute for the fiber piece of the same shape attached to the axle bearing collar on Standard 050 trucks. This piece is riveted to the axle bearing collar with ⅜-in. rivets. Steel was tried at first, but cast-iron was found to give equal service and is cheaper. The increased life of this cast-iron wearing plate as compared with the fiber previously used has resulted in a material saving.



Form of Cast-Iron Axle Collar

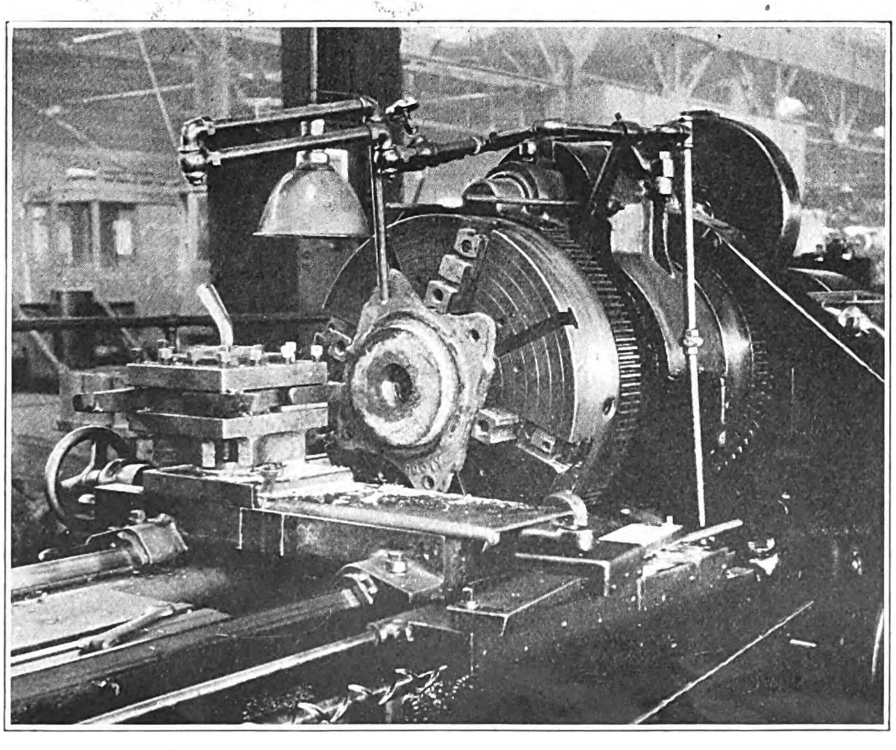
## Multiple Tool Post Expedites Turning

A SWIVEL tool post capable of holding four cutting tools is used by the Pittsburgh Railways on a 16-in. lathe when facing center bearings.

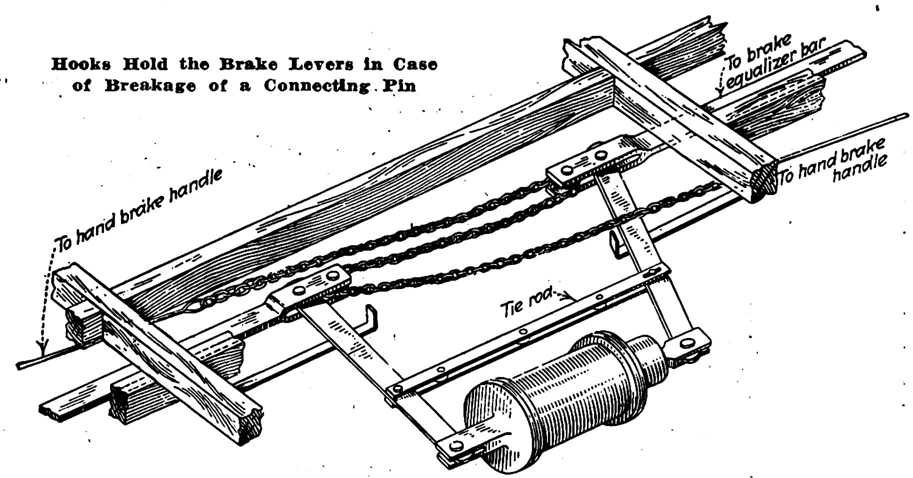
In finishing such a casting it is necessary to use more than one cutting tool because of the curvature of the bearing. Rather than change tools in the ordinary tool post, the proper tools are mounted on a swivel post.

The swivel post is about 6 in. square with a tool groove around the sides. Set screws projecting through the upper edge into the groove hold the ⅝-in. tool steel at each corner. The post is mounted on a swivel which takes the place of the compound. It is locked in place at any desired position.

This device is also used in turning operations as it reduces to a minimum delays caused by necessity to replace dull cutting points. In this use the tool post is simply turned around to the next position and the machining continued with another tool already in place.



Multiple Tool Post on Engine Lathe Used in Facing Center Bearings



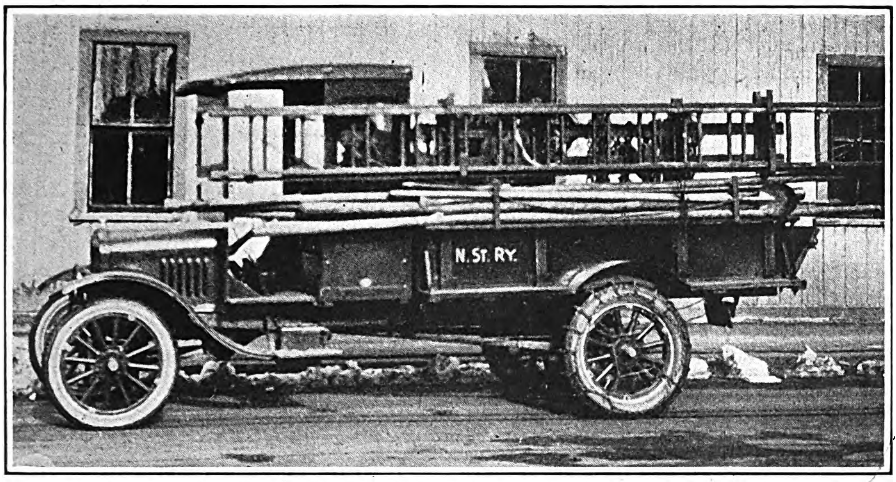
Hooks Hold the Brake Levers in Case of Breakage of a Connecting Pin

## Safety Hooks on Brake Rigging

TWO metal hooks attached to the underframes on double-truck cars are used by the Union Street Railway, New Bedford, Mass., as a safety precaution in case of the failure of some part of the brake rigging. This device, shown in an accompanying illustration, is somewhat similar to that used by the Holyoke Street Railway, which was described on page 111, ELECTRIC RAILWAY JOURNAL, Jan. 19, 1924. A point of difference is that hooks made of steel strips are used instead of chains. A hook of this kind will hold the brake lever in case of breakage of a connecting pin or rod at one end of the car and prevent the brake rigging at the other end being rendered useless. Another point of difference between the practice at New Bedford and that at Holyoke is that only a single tie rod is used between the brake levers.

## Novel Line Truck for Small Road

A LIGHT line truck particularly well adapted to the needs of a small company has recently been built according to plans which were prepared by the Nashua Street Railway, Nashua, N. H. A 1-ton Ford truck was purchased, and the body was built by the railway. As shown in the illustration, the sides have been equipped with hooks to carry extension ladders, poles and long-handled tools on the outside. On the inside of the truck are carried short-handled tools, tackle, etc. The method of operation when making repairs to the overhead lines is to remove the ladder from its supporting hooks, place it against the side of the truck, fasten it firmly into position and

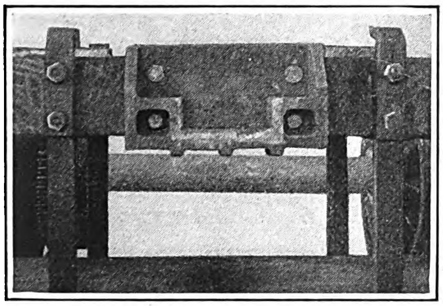


When Making Repairs to the Overhead Lines the Ladder Is Taken Off the Hooks of the Nashua Line Truck and Fastened in a Vertical Position

then extend it upward to a position where the workman can readily reach the overhead line. A convenient feature of this truck is that the sides can be removed altogether and the body used for the transportation of flat material.

## Wearing Plate for Motor Suspension

THE accompanying illustration shows a wearing plate welded in position to the face of the casting used on the truck to support the nose of the motor. This method is used in the shops of the Philadelphia & Western Railway. The wearing plate is $\frac{5}{8}$ in. x 2 in. x 6 in. and is scarfed all around the edges to provide space for the welding metal. This provides a satisfactory means of bringing the nose suspension to its original height, and by welding the plate in position there is no danger of its working loose.



Wearing Plate Welded to the Truck Motor Suspension Casting

## Oilers Increase Life of Bearings

THE installation of vacuum oilers on motors used by the Worcester Consolidated Street Railway and the Springfield Street Railway was begun in 1921 and has been extended continuously since that time. At Worcester 568 have already been installed and 732 more have been ordered from the Railway Improvement Company. At Springfield 560 have been installed and 476 more have been ordered. The chief advantage of these oilers has been their ability to lubricate the older types of motors which previously had an unsatisfactory oiling system.

At the present time the railway is oiling cars equipped with Ransom oilers on a 3,000-mile basis, whereas formerly it was necessary to lubricate them on a 1,000-mile basis and at times even on a 500-mile basis. Aside from the efficiency of the oiler for lubricating, this apparatus has also the advantage of keeping dirt and grit out of the bearings. Both of the foregoing tend to increase the life of the bearing, although no data are available to show just how much this increase amounts to.

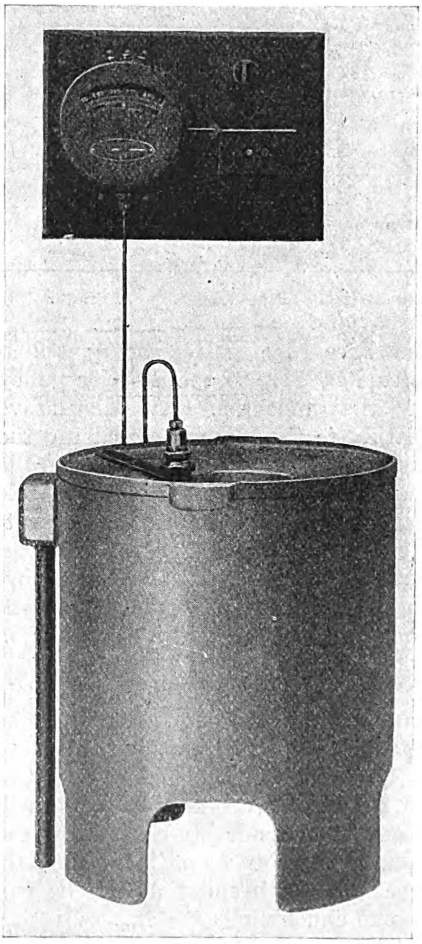
## New Equipment Available

## Babbitt Pots with Automatic Temperature Control

AN ELECTRIC melting pot for melting and maintaining at working temperature soft metals and alloys such as solder, babbitt, lead and zinc is one of the recent developments of the Westinghouse Electric & Manufacturing Company. This melting pot, which is made in two sizes, of 150-lb. and 750-lb. capacity, has thermostatic control that is claimed automatically to keep the temperature of the molten metal at any desired point between 450 deg. and 950 deg. Fahrenheit. A small electric motor controlled by a thermostat throws the snap switch on or off as the temperature of the metal reaches the high or low limit set by the operator, and an even working temperature is assured without further attention.

The heating element and all its conections are mounted on the melting crucible, which can be easily lifted out of its outside casing to make the element accessible. The outside casing surrounding the crucible is lined with an adequate layer of heat insulating material to reduce radiation losses and insure cool shop conditions. The control panel, which may be mounted in any convenient position, consists of magnetic contactors and suitable relays for opening and closing the line circuit. An instrument panel, which is set up adjacent to the pot, contains the thermostat with temperature regulating pointer, the push button switch for turning the current on or off, and a red signal lamp which serves as a warning in case the heat is left on accidentally.

One of the advantages of the electric melting pot is in connection with



New Automatically Controlled Electric Melting Pot the use of lead base babbitt. This metal is greatly affected by either overheating or pouring too cold and therefore can only be used where it can be poured at a constant, accurate temperature. With the temperature control possible through the use of electricity for heating, the pouring temperature can be so closely regulated that the use of lead base babbitt is made possible.

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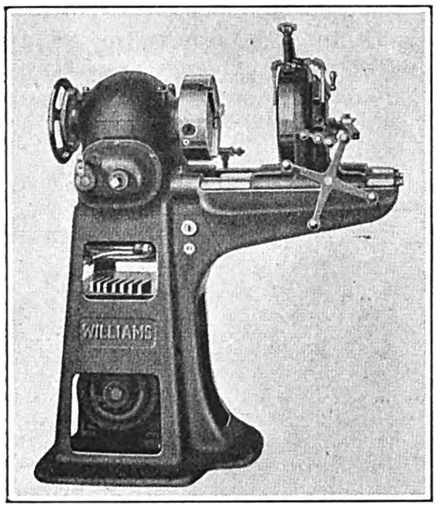
## Portable Machine Cuts, Threads and Reams Pipe

A NEW portable pipe threading, cutting-off and reaming machine has been brought out by the Williams Tool Corporation, Erie, Pa. It has a handy self-contained grinder and is arranged for either motor, belt or hand drive. The motor-driven machine has a standard 1-hp. motor mounted on a hinged table in the base, the power being transmitted by belt to the driving pulley of the machine. A distinctive feature is the method of raising the motor to release the belt and stop the machine by use of a demountable hand crank. Automatic belt adjustment is provided. The machine can be converted to belt drive by removing the motor belt and driving directly from either a line or a countershaft.



Portable Pipe and Bolt Threader

The capacity of the machine is such that it will cut either right or left-hand threads on pipe $\frac{1}{4}$ in. to 2 in., and on bolts from $\frac{3}{8}$ in. to $1\frac{1}{2}$ in. inclusive. The machine will ream the inside and chamfer the outside of pipe from $\frac{1}{4}$ in. to 2 in. The longest thread that can be run at one chucking is $10\frac{1}{2}$ in.

The spindle has two speeds. These are obtained by means of a set of sliding gears. A neutral position is provided so that the spindle may be started and stopped without shutting off the current. All gears are made of steel, machine cut, heat treated and run in oil. The shafts are equipped with long babbitted bearings provided with a self-oiling system.

The front gripping or driving chuck is of the three-jaw, universal, self-centering type. The carriage ways are of extra heavy seamless steel tubing, ground to size and polished. The way nearest to the operator has gear teeth milled on its surface, which engage a pinion shaft for operating the carriage. The die head and carriage are cast in one piece, which prevents the head getting out of alignment. The carriage has six babbitt-lined bearings on the ways.

The cut-off attachment is mounted on the rear of the die head and is operated by a screw and hand wheel. A V-block equipped with hardened tool-steel facings steadies the pipe when it is being cut off. On the cut-off attachment is pivoted the reamer holder, which is operated by a lever. The tool bit used for reaming and chamfering is $\frac{5}{16}$ in. square.

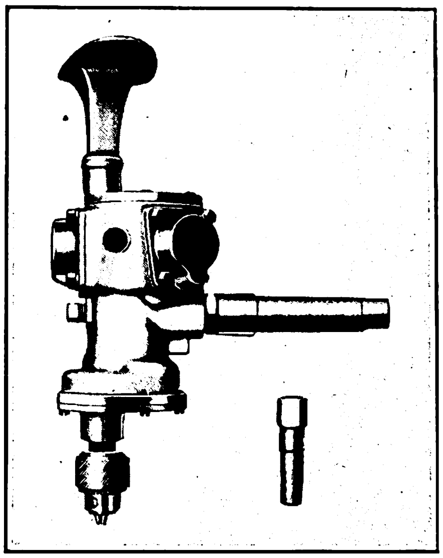
A geared rotary oil pump, located on the rear side of the machine, is driven from the intermediate shaft. The oil is pumped from a reservoir in the base of the machine through a strainer to the pump, being forced from there through a flexible hose to the die head where a three-way valve enables the operator to regulate the flow of oil. After flushing the dies and cut-off tool the oil drains back into the oil or chip pan under the die head, where it is strained before it flows back into the reservoir for reuse.

A feature of this portable machine is a high-speed emery wheel running at about 1,100 r.p.m., mounted on the pulley shaft at the rear of the machine. The wheel, which is 6 in. diameter with $\frac{3}{4}$ in. face, is driven direct from the motor. The design is such that when the operator uses the emery wheel no other part of the machine is running, giving full power to the motor for grinding.

The weight of the machine complete with motor and all standard parts is 520 lb. A special die cabinet cast in the top of the pedestal provides a safe and convenient place for storing dies and for holding any other small tools which are used on the machine.

## Pneumatic Drill Has Renewable Cylinders

A NEW size, light-weight non-reversible pneumatic drill has recently been placed on the market by the Ingersoll-Rand Company of New York. It is known as size D and is suitable for drilling holes up to $\frac{9}{16}$-in. diameter and reaming up to $\frac{5}{16}$-in. diameter. The drill may be fitted with either breast plate, feed screw or grip handle, making it adaptable for a wide variety of work. The salient features of this device are the light-weight aluminum case with steel bushings cast in all the bearing holes and in the throttle hole, cast iron cylinders which are renewable and interchangeable, and a special three-cylinder motor. The renewable cylinders are a valuable feature, as any cylinder can be replaced easily and the motor made as good as new at slight cost.



A New Light-Weight Pneumatic Drill Made by the Ingersoll-Rand Company

The total weight of the new device, including breast plate and chuck, is 14 lb. Its over-all length is 15 in. At 90 lb. air pressure it operates at 700 r.p.m. The three-cylinder motor has the rotating parts all accurately balanced, reducing vibration and wear and tear on the machine. The drill is said to be very economical in regard to the air consumption and cost of maintenance.

The construction of this machine is very similar to that of the No. 6 and No. 600 drills which the same company brought out some years ago and which were suitable for drilling up to $\frac{3}{8}$-in. diameter. Every part is readily accessible for inspection and their success led to the new size with larger bore and stroke.

# Association News & Discussions

## Accidents Analyzed and Elimination Discussed

### Mr .Storrs and Commissioner Higgins Contribute Papers at Conference on Motor Vehicle Traffic at New Haven—Analysis of Connecticut Company Automobile Accidents Throws Light on Relation of Traffic to Accidents

At a Conference on Motor Vehicle Traffic, called by Yale University and held at the Sheffield Scientific School, New Haven, Conn., on April 9, 10 and 11, two papers were read that dealt particularly with problems of transportation by public service vehicles on streets and highways.

In the first, L. S. Storrs, president of the Connecticut Company, discussed the effect of congestion in downtown districts, due to automobiles, on the movement of passengers by street cars, and gave an analysis of accident statistics involving a car and an automobile. In the second paper Chairman R. T. Higgins of the Public Utilities Commission of Connecticut spoke on automotive public service vehicles, with reference to state regulation.

Mr. Storrs pointed out that automobiles owned in Massachusetts, Rhode Island and Connecticut equal one-third of the total number registered in the world, outside of the United States. Increasing congestion works a hardship on operatives by limiting the range of their movement between home and shop; it limits the supply of labor to industry, and it discourages shopping in the business centers of our cities.

Street cars are now carrying more people than at any time in the past, and there is a demand for constantly increasing facilities. The substitution of cars of larger capacity is only a palliative. The real need is for more cars, but their addition, with the increasing number of automobiles, will make the congestion on our streets still more acute.

In New Haven, 86 per cent of the passengers entering and leaving the central area are carried on street cars comprising 27 per cent of the total vehicles. The other 14 per cent use private automobiles, comprising 73 per cent of the vehicles. The accident hazard due to this congestion has received close study. While the monetary loss is of small importance as compared with loss of life or personal injury, it means an average expense to the electric railways of the United States of 4.6 per cent of the passenger revenue, or $44,000,000 a year. In Connecticut it is below the average, being but 3 per cent, or $400,000 annually.

The total number of accidents on about one-third the mileage of the country decreased from 1920 to 1922, while those involving automobiles and street cars increased 13 per cent. In Connecticut those not involving automobiles decreased from 4,889 in 1918 to 4,279 in 1923; the automobile cases increased from 3,505 to 5,258 for the same years.

#### Analysis of Accidents

Efforts to reduce accidents have taken the form of education of employees and, with the co-operation of the authorities, of school children, track relocation, cutting banks and brush at obscure road crossings, and introducing light-weight cars capable of stopping in a short distance.

By requiring reports on all cases, even the most trivial, the company has records of eight times as many accidents involving cars and automobiles as were listed by the Motor Vehicle Department, to which only those involving personal injury or material damage must be reported.

The following is an analysis of the 5,258 reported in 1923:

| Accident | Number | Per Cent of Total |
|---|---|---|
| Automobile turning out from curb, hit by trolley | 693 | 13.3 |
| Automobile coming out of intersecting street at motorman's right | 281 | 5.5 |
| Automobile coming out of intersecting street at motorman's left | 298 | 5.5 |
| Automobile hit in rear, trying to pass moving car, same direction | 522 | 10.0 |
| Automobile colliding head-on with car | 340 | 6.5 |
| Automobile hitting standing car, excluding head-on | 698 | 13.2 |
| Automobile sidewiping car, same direction | 624 | 11.8 |
| Automobile sidewiping car, opposite direction | 506 | 9.7 |
| Automobile struck backing out of driveways or buildings | 92 | 1.7 |
| Automobile struck in rear by trolley, due to sudden stopping | 375 | 7.1 |
| Automobile ran into moving trolley car, same direction | 224 | 4.2 |
| Automobile parked, hit by car | 588 | 11.2 |
| Automobile hit at grade crossings | 17 | 0.3 |
| Total | 5,258 | 100.0 |

The preponderance of accidents due to carelessness on the part of the automobilist is noteworthy. The largest number are those occurring when automobiles were pulling out from the curb, probably due to the frequent neglect to give a signal. On wide streets this type of accident practically vanishes.

Vehicular congestion in the central portion of our cities leads to numerous minor accidents, mostly to pedestrians; it affects all residents who have occasion to visit the business districts, and warrants most careful consideration by expert examiners.

A survey in St. Louis showed 9,842 vehicles entering the business district daily, while parking area is available for only 2,500. In Chicago 51.3 per cent of vehicles entering the Loop district are autos carrying 18.9 per cent of the passengers. Two per cent are street cars carrying 74 per cent of the passengers. Figures for New Haven have been given, from which it appears that 86 per cent of passengers are being inconvenienced for the other 14 per cent who average not over 1.75 per automobile.

#### Commissioner Advocates Bus and Truck Regulation as Means of Reducing Accidents

Mr. Higgins pointed out that the automobile has established its permanency in the transportation field, in recognition whereof the Connecticut Legislature in 1921 declared motor vehicles operated in such manner as to afford transportation similar to that afforded by street railways to be common carriers and subject to public regulation.

Under this act bus routes have been established totaling 672 miles, mostly in suburban and interurban territory. Operation has been authorized of 239 cars, touring and bus types, in addition to 53 buses operated by street railway companies.

It would be unwise seriously to impair the usefulness of railroads and railways, which have demonstrated their necessity in the activities of our country, by allowing destructive competition. But the public service motor vehicle will become a still more important agency in intrastate, and somewhat in interstate, transportation of freight and passengers, because of improvement in mechanism and flexibility of service.

They should then be under public regulation and control. At present only the jitney is under such control, while the numerous freight trucks are without any public regulation.

Under its broad jurisdictional powers the commission has prescribed rules, the violation of which may be followed by revocation of certificate. This circumstance has been a strong incentive to careful operation. Since the law went into effect, July, 1921, there has been but one fatal accident, and that one not due to the jitney operator.

Motor vehicle transportation should come under state control, and even where interstate traffic is involved the control should be by co-operation of the regulatory bodies of the two or more states interested.

# American Association News

## Introducing Traction Tom

By Labert St. Clair

Director of Advertising, Committee of One Hundred, A.E.R.A.

TRACTION TOM, a new figure in the electric railway field, is being introduced to the industry by the advertising section of the American Electric Railway Association.

Tom has been given a permanent assignment as the representative of all the electric railway employees in the United States to tell the public something about the traction business in the language of the worker behind the guns. He is to appear on posters, in newspaper ads and other channels.

Samples of posters and newspaper cuts already have been sent to all electric railway companies in the country and manufacturer members of the association. They are ready for distribution. A series of newspaper advertisements is being prepared and will be ready within another week.

Tom is the outgrowth of the poster series called "The Men Behind the Electric Railways," recently distributed by the Committee on Co-operation of Manufacturers. That series proved a popular one, some 200 electric railway companies using it, and reports from them indicate that the public read the posters with interest.

In creating Traction Tom an effort has been made to reflect in his face the spirit of courtesy and enthusiasm which is manifest in progressive electric railway employees throughout the country. It is the conviction of the manufacturers' and the publicity committees that Tom's friendly countenance will carry the real message of the electric railways to the riding public and arouse a keener appreciation of the work that the employees are doing in providing safe, comfortable rides for customers.

Tom's introductory remarks, through *Truth*, a clip-sheet issued by the association, epitomize fairly well his purpose. This is what he says:

"I am Traction Tom. I speak for the 500,000 workers in the United States who draw pay, directly or indirectly, from the electric railways.

"We are a very important part of a great industry that is on the come-back road after some hard knocks.

"We are out to boost the electric railways because they are necessary and because without them our jobs just wouldn't be."

It is hoped that in addition to using the standard material which is prepared by the association's advertising section companies will localize Tom to the fullest possible extent. The best good can be obtained from using him by tying him up locally with current events through his comments on them. Tom really should be made a sort of browsing salesman for local electric railways, and the closer he gets to home with his comments the more valuable he will be.

Here's a sample of one of the newspaper ads now being offered by the advertising section, which shows the chatty sort of text that Tom's face seems to fit:

### "I Liked That City—The Cars Wait for You"

> "I was down in Memphis, recently, and an old friend of mine told me how her mother always swore by a certain big city in the eastern part of the United States.
>
> "For a long time the old lady never mentioned any specific reason for liking the town, and, finally, after she had bragged and bragged about the place, my friend asked why she liked it.
>
> " 'Well,' she explained, 'the street cars always wait for you there.'
>
> "Probably the old lady, like many persons, thought many electric car men run away from customers purposely.
>
> "They don't. In fact, if they did and the boss found it out, their jobs wouldn't be worth much. Sometimes my buddies overlook folks and pull away from them. But none of them ever does it purposely.
>
> "If you ever think they do, write the boss. He and the rest of us will appreciate it.
>
> "But please make all the haste you can. We men have to keep a certain schedule with our cars just like steam railroad engineers, you know. TRACTION TOM."

Full details regarding Traction Tom and how to use him will be supplied by the association if you will just drop it a line.

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## Heavy Traction

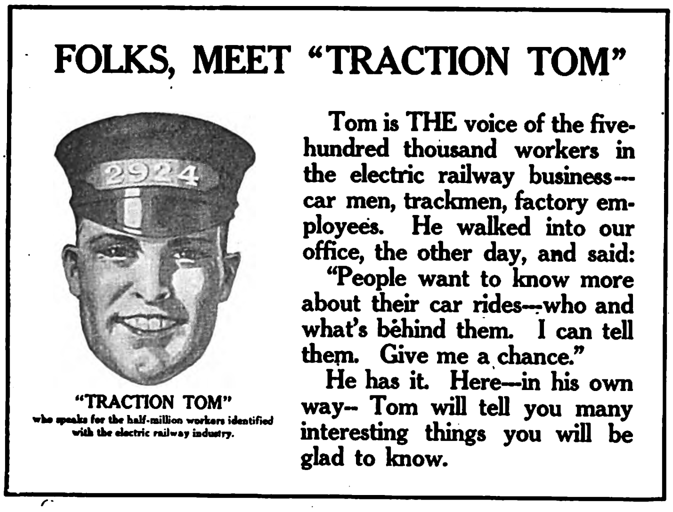
A MEETING of the heavy traction committee of the Engineering Association was held at New York on April 15. The sub-committee on revision of the bibliography on heavy electric traction, H. F. Brown, chairman, reported that it had been decided that the bibliography should be held to a selected list of publications. Professor Warner, who is in charge of the revision, has done some considerable preliminary work. A proposed classification of the index was presented for consideration of the committee, and a number of changes were suggested. The entire matter was referred back to the sub-committee with instructions to proceed along the line of its report.

Mr. Armstrong was appointed chairman of a sub-committee on branch-line electrification, to obtain data on self-propelled cars, Diesel-electric, gas-electric, and battery locomotives.

A report of the sub-committee appointed to study train operation, with particular reference to articulated trains, was presented by its chairman, Mr. Sinclair. A drawing has been prepared showing the various articulated trains built or proposed.

Mr. Daus, chairman of the sub-committee to study methods of connection between cars, has prepared a questionnaire on methods of coupling, including air and electric circuits. It is the intention to send out this questionnaire to all railways operating trains.

Members present were J. C. Davidson, chairman; A. H. Armstrong, H. F. Brown, Morris Buck, A. H. Candee representing H. W. Cope, A. H. Daus, J. H. Davis, J. V. B. Duer, Norman Litchfield, J. O. Madison, J. J. Sinclair, L. S. Wells, C. R. Harte, sponsor, and G. C. Hecker of association headquarters.

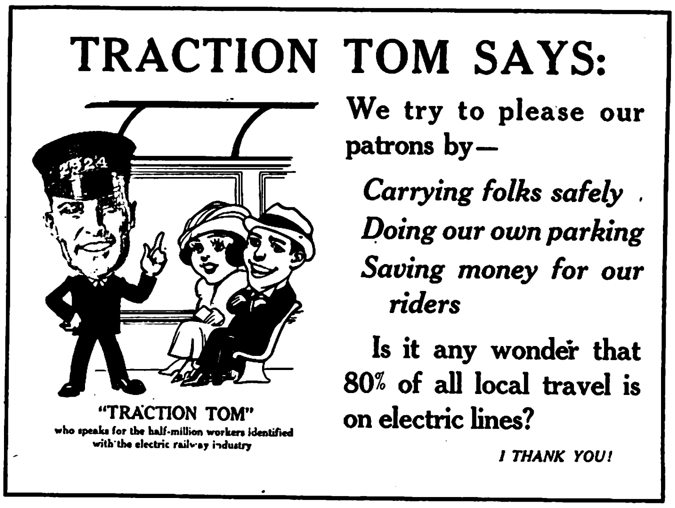


FOLKS, MEET "TRACTION TOM"

Tom is THE voice of the five-hundred thousand workers in the electric railway business—car men, trackmen, factory employees. He walked into our office, the other day, and said: "People want to know more about their car rides—who and what's behind them. I can tell them. Give me a chance."

He has it. Here—in his own way— Tom will tell you many interesting things you will be glad to know.

"TRACTION TOM"
who speaks for the half-million workers identified with the electric railway industry.



TRACTION TOM SAYS:

We try to please our patrons by—

*Carrying folks safely*
*Doing our own parking*
*Saving money for our riders*

Is it any wonder that 80% of all local travel is on electric lines?

*I THANK YOU!*

"TRACTION TOM"
who speaks for the half-million workers identified with the electric railway industry

Two Samples of the "Traction Tom" Series of Posters Put Out by the Advertising Section of the A.E.R.A.

# The News of the Industry

## Engineers Report at Detroit

### Underground Lines Suggested for Use Downtown with Super-Highway System of Suburban Feeders

Daniel L. Turner, consulting engineer, and John P. Hallihan, engineer in charge for the Rapid Transit Commission of Detroit, recommend underground lines in downtown Detroit and surface lines on private right-of-way in suburban districts. This plan is suggested as the backbone of the future transit system. Based on the engineers' report the commission has also recommended a system of 217 miles of super-highways with a width of 204 ft. The report of the engineers containing these recommendations has just been made public. It follows a report on financing rapid transit, which was published in this paper Dec. 8, 1923.

The present report submitted by the engineers relates to the district outside the built-up portion, referred to as that part between the 6-mile and 15-mile circles. The subway system for the city of Detroit will be covered in a report to be issued later. The suggestion for the proposed super-highway system has been discussed and considered with the officials of the communities that it would affect directly.

The engineers point out that Detroit is now being strangled because of lack of streets. It is believed by the engineers that by 1950 Detroit will probably extend out 11 miles from the present center. The proposed super-highway system is designed to serve an area more than three times that of the present city and that area is almost entirely outside of the Detroit of today. The super-highway district is definitely outlined. In the 204 ft. super-highways there will be a central space of 84 ft. for the exclusive use of rapid transit lines on rails. Tunnels underneath the rapid transit tracks and the express motor lane will give access to either side of the street for pedestrians as well as motor vehicles. The rapid transit and express motor services will not be subjected to any crossing interferences.

At a rapid transit station, the rapid transit and motor express lanes would be elevated to permit tunnels for intersecting traffic. The upgrade would aid in retarding rapid transit cars as they approached a station, while the down grade on the other side would aid in accelerating the cars. Passengers alighting from rapid transit cars would descend a stairway at the station, pass to the tunnels underneath and reach the side of the highway. Rapid transit lines would dip under or cross over the intersecting line. As such lines approached the built-up sections of the city they would dip underground and thus reach the heart of the city.

A plan is being drawn up by P. J. M. Hally, counsel for the commission, and a bill is to be submitted to the Legislature which would create a transportation district and permit the levying of an annual tax of one half mill, which would provide from $1,250,000 to $1,500,000 annually for the purpose of acquiring the right-of-way for the super-highways.

The super-highway, it is claimed, will also supply rapid transit on rails in the future at the cheapest cost to the community, even including the cost of the right-of-way necessary. The cost of constructing the permanent way of a four-track rapid transit line on the super-highway, but exclusive of real estate and equipment, it is estimated, will be about $1,100,000 a mile, whereas a subway would cost about $5,500,000 a mile. At the start, the report states, only two-track lines will be required. They will suffice until the city has spread out beyond the 10-mile limit.

The report further states that inside the city, where existing streets control, only underground or elevated lines can be considered, with the underground line preferable.

## Fifty Buses for Cleveland

A fleet of not less than fifty buses is to be operated by the Cleveland Railway to supplement electric railway service in Cleveland. Announcement to this effect was made by John J. Stanley, president, on April 16, when the company formally asked the Ohio State Public Utilities Commission for a certificate of convenience and necessity, as required by the Ohio state law.

The application of the railway followed dismissal by the commission of the request of the Cleveland People's Motor Bus Company for similar permission. A hearing on the Cleveland Railway's application has been set for May 29.

The buses will be of the double-deck type. They will be used over five routes, part of which will parallel railway lines. The rate of fare will be at least 10 cents, according to the company, and may be double the present railway fare in Cleveland, which is 6 cents cash, with a 1-cent charge for transfer.

"It is the idea of the company to attract to the motor bus automobile riders and not street car riders," said Joseph H. Alexander, vice-president of the company. "We hope to induce people to ride the buses instead of driving their own automobiles to business. Our bus plans call for quality service."

The routes will run from the suburbs of Lakewood, East Cleveland, and Cleveland Heights, along boulevards and some along streets now covered by street car tracks. They will all end at the Public Square.

## Legislature in Review

### Some Outstanding Accomplishments of New York Body Reviewed Briefly —Tax Committee Bill Killed

The Legislature of New York State, in annual session adjourned April 10, will be remembered for having passed a 25 per cent income tax reduction law good for 1924 only, for having enacted a home rule enabling act for cities made mandatory upon it by constitutional amendment, for the passing of a compromise transit bill affecting transportation in the city of New York, for having committed the state to a policy of the ultimate expenditure of $300,000,000 for grade crossing elimination and $100,000,000 for the construction of new buildings and improvements by the issue of bonds, if constitutional amendments passed at this session are approved at a subsequent legislative session and receive the favorable vote of the people, and for having consistently refused to adopt a system of public utility regulation and plan of municipal operation of as radical a nature as was ever presented to a legislative body.

The general amendments to the transportation corporations law intended to simplify the procedure of forming utility corporations and functioning under the statute, introduced during the closing days of the session by Senator Fearon, failed to be reported for consideration, but it was anticipated that this subject would go over for another year and the bill was introduced to show progress of the committee and get something tangible before the public so that the interests affected would have opportunity to study the proposed law.

### HOME RULE ACT PASSED

The home rule enabling act was finally passed as a new consolidated law instead of being made a special act. It will give to municipalities a certain degree of regulation over public utilities, and the fear that the courts might interpret this power so as to give New York City power to intervene in transit matters is responsible in no small degree for the final compromise reached in relation to this subject.

Among the bills in the Governor's hands as thirty-day bills may be mentioned:

The Garnjost bill (Assembly Print No. 1650), amending Section 53-a Public Service Commission law by providing for the electrification of railroads in the cities of Yonkers and Mount Vernon.

The McGinnies bill (Assembly Print No. 1863), making an addition appropriation of $3,500,000 toward the construction of the New York-New Jersey vehicular tunnel.

The Davison bill (Assembly Print No. 2241), adding new Section 26-b general corporation law, by providing preference in payment of judgments recovered in actions for torts against public service corporations shall be given in liquidation of affairs of the corporation.

The Russell bill (Senate Print No. 546), extending for one year from date of passage of bill the operation of the street railway line of the Nassau Electric Railroad known as the Park Avenue line without exchanging transfers.

The Fearon bill (Senate Print No. 1280), amending the railroad law and stock corporation law, authorizing a domestic railroad corporation to increase or reduce its capital or capital stock pursuant to Section 37 stock corporation law.

The Davison bill (Assembly Print No. 2304), amending the tax law, in relation to the payment and distribution of corporation franchise taxes.

The Legislature amended the workmen's compensation law reducing the non-compensated period after accident from seventeen to seven days, increasing the death benefits for accidental death and increasing the number of payments during the healing period after injury.

Noticeable among the recommendations of the Governor which was killed was the proposition to create a disinterested commission of experts to study the entire tax system of the state, to devise ways and means of relieving public utility corporations from unequal assessments and to suggest a plan which would provide a staple source of revenue for the support of the schools. As a substitute for this, the Davenport-Sheridan tax committee was continued, with an additional appropriation of $25,000.

## I.R.T. Will Reduce Wages Five per Cent

Announcement was made by Frank Hedley, president of the Interborough Rapid Transit Company, New York, N. Y., that because of increased expenses in operation and loss of passenger revenue a 5 per cent reduction in wages is proposed for July 1. This reduction would bring the wage scale back to that in operation two years ago. At that time the men accepted a decrease of 10 per cent. Last June the wages were increased 5 per cent. According to Mr. Hedley this increase of last June amounted to an increase in operating expenses of about $1,250,000 for the year. Notification of the wage reduction was made in a circular to the men which said that the company could not buy its supplies cheaper, could not get further reduction in rental and could not borrow more money while its business was in the present condition. No statement has been made through the brotherhood of the Interborough employees.

## Final Hearing on Fares in Connecticut on June 2

Another snag in the fare settlement in Connecticut was struck at the resumption of the hearing before the State Public Utilities Commission in Hartford on April 14. At the conclusion of the hearing officials of the Connecticut Company were ordered to report the details of operation expenses to the commission not later than May 12. A final hearing will be held at Hartford on June 2 after an allowance of three weeks for those opposing the fare increase to study the data.

Meanwhile fares will remain as at present, with tokens at the rate of three for 25 cents for all lines in the State except those in Bridgeport. There the rate of two rides for 15 cents will be continued under commission order until the entire question of fares for the State has been decided. Attorney Watrous for the Connecticut Company wanted the fare in Bridgeport to be raised at once to three rides for 25 cents.

Edward G. Buckland, vice-president of the New York, New Haven & Hartford Railroad, which owns $40,000,000 of stock of the Connecticut Company, asked that the Connecticut Company be permitted to earn a fair return upon the value of its property devoted to the service of the public. The earnings of the Connecticut Company are given elsewhere in this issue.

## Capital Traction Employees Receive a Two-Cent Increase

The board of arbitration, by a vote of two to one, has granted the employees of the Capital Traction Company, Washington, D. C., an increase of 2 cents an hour. William Knowles Cooper, chairman of the board, and Stanton C. Peelle, the company's representative, voted for the increase, while Representative Tague of Massachusetts, for the men, dissented on the ground that the advance was not sufficient. The men had petitioned for a flat increase to 70 cents an hour. The agreement fixes the following schedule for the Capital Traction: First three months, 52 cents an hour; next nine months, 56; thereafter, 58 cents. At the present time both the employees of the Washington Railway & Electric Company and the Capital Traction Company are receiving 50, 52, 54 and 56 cents. It was roughly estimated that the increase would add between $65,000 and $70,000 a year to the company's payroll expenses. No action has been taken yet on the scale of the Washington Railway & Electric Company's employees.

## Two Bus Ordinances Offered in New Orleans

Commissioner Paul H. Maloney of the Department of Public Utilities of the city of New Orleans, La., has offered two ordinances to the Commission Council calling upon the New Orleans Public Service, Inc., to operate a bus service on the streets not now served by railway lines in the upper and lower sections of the city. This is in keeping with the recommendations contained in the Beeler report, which has not as yet been adopted by the Commission Council. The delays incident have occasioned the residents of that area, a thinly-settled portion of the city, great discomfort and inconvenience to reach the street cars.

The officials of the company are reported to have expressed themselves as ready and willing to meet the requirements of the city, in so far as single-deck buses are concerned, but allege that the spreading branches of the big oak trees, in the outlying districts, may make it impractical and hazardous to use double-deck buses on the routes. They assert that the buses will be in readiness for operation within sixty or ninety days.

## Ninety-Cent Rate Asked

### This Is Maximum Rate Requested in New Cleveland Contract Dating from May 1

Motormen and conductors of the Cleveland Railway, all of whom are affiliated with the Amalgamated Association, have filed a formal demand for an increased wage.

The men are now getting 55 cents an hour for the first three months' service, 57 cents an hour for the next nine months, and 60 cents an hour after the first year. They are asking 85, 87 and 90 cents an hour. The highest previous wage scale paid by the company in 1921 was 70, 72 and 75 cents an hour.

In addition to the wage increase the men also make the following demands:

Workday in the week as near as possible straight eight hours.

Pay on regular runs based on eight hours, minimum.

Time and a half over nine hours.

Sixty per cent of runs laid out inside nine hours.

Thirty per cent inside twelve and a half.

Ten per cent inside fourteen.

Fifteen minutes' extra pay for twelve-and-a-half-hour completion.

Thirty minutes' extra pay for thirteen hour completion.

Forty-five minutes' extra pay for thirteen-and-a-half-hour completion.

Hour extra pay for fourteen-hour completion. (Many runs are now divided between morning and evening rush travel.)

Union to have voice in altering schedules to shorten runs and hours.

Eight-hour runs and time and a half on all Sundays and holidays.

Eight-hour runs at ten-hour pay at night.

Regular crews to get time and a half for extra runs.

Six-hour minimum pay for "trippers."

Breaks or layoffs in regular runs to be paid for as platform time up to one hour.

Allowances for reporting, whether or not assigned to duty.

Thirty minutes' extra pay for making out each accident report.

One day off in eight with pay.

Two weeks' vacation each year with pay.

Five cents an hour extra for instructing new crews.

Company to furnish change for conductors.

Passengers who report trainmen to be compelled to make deposit to reimburse him for time lost in investigation if charges against him are not sustained.

Heating of all cars from Oct. 15 to April 15, instead of from Nov. 1 to April 1, as at present.

Ten minutes' layover at end of every trip and comfort stations at end of every line.

Trainmen under suspension to be relieved of punishment if asked to report during time of suspension.

Pay for the ten minutes time for reporting required of all crews before starting day's work.

John J. Stanley, president of the company, said to grant the demands would increase the payroll $5,000,000 a year and necessitate a 10-cent fare.

The present agreement between the company and the union calls for arbitration of the men's demands. Apparently because the men did not get all they asked for a year ago, they are also asking to have the board of arbitration changed from a three-men body to one composed of five men, two to be named by the company, two by the union and the fifth to be appointed by the Governor of the State in case the four cannot agree. Under the present plan the umpire is appointed by the local federal judge.

The present agreement expires May 1. A prolonged dispute appears likely over the question of changing the composition of the board of arbitrators from three to five members.

## No Opposition to Buses in Rensselaer

An informal hearing was held at the City Hall in the city of Rensselaer April 15 at which General Manager Murphy of the United Traction Company appeared and explained the route on which the United Traction proposed to substitute bus transportation for trolley service. The company proposes to abandon railway service on the Broadway-Akin Avenue line in that city. This hearing was called by the Common Council to get an idea of sentiment before the introduction of any ordinance.

No opposition developed at the hearing to buses being substituted for trolley service.

The Capitol District Transportation Company, Inc., Albany, N. Y., was recently formed to operate stage or omnibus routes in Albany, Rensselaer and Saratoga counties. It has a capital of $100,000. The directors and subscribers are Leonor F. Loree, New York City; William H. Williams, Lyon Mountain, N. Y., and Harry B. Weatherwax, Albany, N. Y. The attorney is John E. MacLean, 598 Broadway, Albany, N. Y.

This is a subsidiary of the United Traction Company formed to make application for the operation of buses and trackless trolleys in Rensselaer and Cohoes. The attorney is attorney for the United Traction Company and the Delaware & Hudson Railroad.

## Detroit Will Try Trackless Trolley

The Department of Street Railways, Detroit, Mich., will carry on experiments with one of the latest models of trackless trolleys which is expected to arrive in the city shortly.

The type of trackless trolley which is to be tried out is of large capacity, carrying approximately as many passengers as one of the one-man cars now in use on certain lines in Detroit. It has been announced that several of these cars will be purchased if the trials prove such equipment to be adaptable to Detroit's needs and conditions. They will be for use in the outlying districts.

## Subsidiary Bus Company Formed

A certificate of public convenience was granted recently to the Valley Motor Transportation Company of East Liverpool and Steubenville by the State Utilities Commission at Columbus, Ohio. The Valley Motor Transportation Company is a subsidiary of the Steubenville, East Liverpool & Beaver Valley Traction Company. The commission extends to the company the right to establish and operate bus lines in East Liverpool and Steubenville.

The company at the present time is maintaining bus service on the old River Road line between the Diamond and the Mulberry Street junction and also along the Lincoln Highway between Pleasant Heights and Stop 55. A bus is also operating on the La Belle View line in Steubenville. The company began the operation of buses on the Pleasant Heights and River Road lines immediately upon settlement of the car strike about a year ago, when it took over cars which had been purchased by the Ceramic City Motor Car Company.

## Washington Fare Measure to Be Included in Appropriation Bill

Although hearings have not been concluded by the Senate District of Columbia committee on the bill seeking to force a 5-cent fare in Washington, Senator McKellar, author of the measure, has practically abandoned his effort to secure action on a separate measure and has served notice that he will make an attempt to have the proposal attached to the District of Columbia appropriation bill as a rider. The appropriation bill is expected to reach the Senate about May 1.

The McKellar 5-cent fare bill is opposed by the Capital Traction Company, the Washington Railway & Electric Company and the Public Utilities Commission of the District.

In testifying before the Senate committee, Senator McKellar took the position that the franchise contracts of the two corporations provide for a 5-cent fare. He says that the return allowed by the Public Utilities Commission is based on excessive value.

Officials of the two companies have shown that the income of both railways had decreased steadily since the war ended. While the Capital Traction Company last year earned 7 per cent, plus, on its fair value as fixed by the Public Utilities Commission, the Washington Railway & Electric Company fell far below this figure. The two corporations combined earned less than 6 per cent on their combined fair values.

The present fare in Washington is 8 cents cash, or six tokens for 40 cents.

## Operators Tell About One-Man Cars to Help Dayton

City Attorney J. B. Harshman of Dayton, Ohio, has returned to Dayton from New York City, where he went to inquire into the use of one-man cars. Upon the application of Attorney J. Sprigg McMahon, of the law firm of McMahon, Corwin & Landis, representing the railways in Dayton, the depositions of a number of the electric railway operators in the East were taken. Among those who were examined were C. W. Kellogg of Stone & Webster; C. E. Morgan, Brooklyn; E. M. Walker, Schenectady; John E. Duffy, Syracuse. E. J. Murphy, chief statistician of the American Electric Railway Association, corroborated the testimony of the railway officials. An ordinance intended to prohibit the use of one-man cars in Dayton was passed some time ago, but enforcement of its provisions has been delayed. It is said now that the situation will probably be solved by an arrangement being put into effect under which both one-man and two-man cars will be permitted to operate under a definite arrangement which will fix the hours of use of each class of vehicle.

## Jitneys Cease Operation in Houston

In accordance with the terms of an ordinance jitneys ceased operation in Houston on March 31. Prior to that date a petition had been filed by several jitney drivers seeking to enjoin the city from enforcing the ordinance, but the city attorney answered by filing a general demurrer which was sustained by the district judge. The attorneys for the jitney drivers gave notice of an appeal to a higher court, but as yet no date has been set for the hearing.

The Houston Electric Company began its increased service on March 28, and on the morning of April 1 was fully prepared to handle the additional traffic. The company is now operating three 29-passenger Yellow Coach buses in all-day service and six during the rush hours over the route of the former Austin jitney line.

The only changes necessary in the operation of the railway system to care for the jitney riders, and to prevent congestion in the downtown district, was the addition of extra cars, rerouting of three lines in the business section, and the use of street collectors.

## Eastern Massachusetts Carries Dash Signs to Attract Business

The Eastern Massachusetts Street Railway, Boston, Mass., has been carrying dash signs on its cars for the purpose of attracting more business to the railway. The posters are 21 in. x 13 in. in blue, red, maroon and green type, carrying such messages as "Park your worries at home," "Travel by trolley," "Snow ahead—store auto and use trolley," "The street car stops near all the shops," "Shop by trolley and keep out of the auto jam," and "Travel by trolley for convenience and economy." The publicity campaign was started just before Christmas. Each of the signs was carried about two weeks, with two signs on each car.

The effect on riding is not known as yet; however, a large number of favorable comments from people in the territory have been received by the company, a fair indication that the dash signs have done some good.

## Conferences on Wage Matter Scheduled in East St. Louis

Officials of the East St. Louis & Suburban Railway and its East St. Louis Amalgamated employees will confer regarding a new wage scale to take effect when the present contract expires on May 1. A decision to ask for an increase in wages was reached at a meeting on April 10.

The present wage scale in East St. Louis provides a maximum of 56 cents an hour for suburban men, 54 cents for city men and 58 cents for operators of one-man cars. Men employed three months or less get 45 cents; for the next six months, 48 cents, and at the end of nine months 53 cents. After a year they receive the maximum pay for regulars. Conductors and motormen in St. Louis are paid a maximum of 67 cents an hour.

## News Notes

**Providence Council Opposed to Fare Increase.** — The Common Council of Providence, R. I., recently concurred in a resolution directing the city solicitor to appear before the Public Utilities Commission to oppose any increase in fare for the United Electric Railway until the fare zones are extended to the city line. In the annual report of the company it was intimated that the railway would soon petition for increased fares.

**Offices Moved.**—The Chicago Surface Lines, Chicago, Ill., is moving some of its offices from the eleventh floor of the Illinois Merchants Bank Building to the fourteenth floor of the newly completed section of the building. After April 14 the executive offices will all be on the fourteenth floor and the address will be 231 South La Salle Street.

**Fares Lowered.**—The new management of the Hornell Traction Company, Hornell, N. Y., has reduced the fare from 8 cents to 7 cents. Some time ago it was announced that the line would probably discontinue service because of financial difficulties. Later it developed that the bondholders voted to have the interest of the company turned over to Raymond Page and W. C. Whitaker. One of the first things the new management did was to reduce fares in the hope of regaining patronage.

**Committee Appointed to Formulate Plan.**—Another step in the solution of the Spartanburg traction muddle was taken on April 9 with the appointment by the Chamber of Commerce of a committee of prominent unbiased citizens to study the situation and advance a plan that would be acceptable both to the city and the South Carolina Gas & Electric Company. The Chamber of Commerce officials believe that the present inadequate transportation facilities are a distinct disadvantage to the growth of the city.

**Bus Line to Replace Railway.**—Announcement has been made that the Public Service Railway, Newark, N. J., plans to tear up its tracks in Scotland Road, south of Central Avenue, Orange, and operate a bus line between Morris Avenue and the carhouse at Washington and Dodd Streets, that city. It is expected track removal work will start as soon as definite assurance is received from the county that the freeholders are going to pave and take over the road between Morris Street and Central Avenue. The bus line is to be started within the next month.

**Debut of Surface Service Magazine.**—Because the company feels that there has been developed a widespread and genuine interest in the activities of the Chicago Surface Lines it has started the publishing of a company pamphlet called "Surface Service Magazine," which will aim each month to discuss public questions and will disseminate news and comment of special local interest. The publication will broadcast the work of all departmental units in the belief that it will help toward making the Chicago Surface Lines a model for the transportation world. The première contained some twenty pages, including stories on "Measuring Power Consumption," "Strong for Accident Prevention," and "Caring for the Eyes." In addition the readers were given a few laughs in the selection of some real jokes.

**Fares Increased in Texas Towns.**—The City Commission of Denison, Tex., has granted the application of the Texas Electric Railway, which operates local service in Denison, for authority to increase the fare charged in Denison from 5 cents to 7 cents. The application set forth that the company found it impossible to maintain efficient service with a 5-cent fare. The company will sell four fare tokens for 25 cents and will grant one-half fare for all students where books of tickets are purchased. A similar increase was granted by the City Commission at Sherman, which is also served by the Texas Electric Railway.

**Six-Cent Fare Extended.**—The City Council of Richmond, Va., has again extended the 6-cent fare privilege to the Virginia Railway & Power Company for its Richmond lines. Ordway Puller, chairman of the Council committee on streets, promised action on the franchise of the Virginia Railway & Power Company within the next sixty days. The franchise requested by the company would combine all of its various contracts with the city, expiring at various times during the next ten years, under one agreement. Mr. Puller said he would at a later date issue a detailed statement explaining why there has been delay.

**Baseball and Transit Guide in One.**—Dates for New York City baseball games are included in a pamphlet recently issued by the Interborough Rapid Transit Company, New York. The pamphlet, called "Ride on the Open Air Elevated," contains a map which is designed primarily as a guide for patrons on elevated lines. Some valuable pointers on both local and express service are included as special features of the "L" service. When the reader wearies of traveling from Brooklyn to the Yankee Stadium or the Polo Grounds he can look over the schedule of the Yankees and Giants "at home."

**Co-operation Brings Better Traffic Results.**—Co-operating with the police department and practicing double-berthing instead of single-berthing at the corners, the Grand Rapids Railway, Grand Rapids, Mich., has succeeded in cutting the rush-hour time through the business section of the city from thirteen to eight minutes, according to L. J. DeLamarter, vice-president and general manager. Loading platforms at several corners have greatly aided in the time saving, particularly since the platforms have been lengthened to accommodate two cars. The double-berthing enables two cars to move forward at the same time. As a further help police have been permitted to wave on cars against the traffic lights when such move will expedite keeping the street clear. This is practiced especially when cars turn on to the avenue from side streets.

**Rate Case Closed.**—The rate case of the International Railway, Buffalo, N. Y., before the Public Service Commission on the application of the city authorities of Buffalo for a return to the 5-cent fare, has been closed and the evidence is now being considered by the Public Utilities Commission. At the final hearing before the commission counsel for the International Railway asked dismissal of the city's application and approval of the company's request for an 8-cent city fare. A 7-cent fare with four tokens for 25 cents is now being charged in Buffalo.

**Commission to Settle Dispute.**—The State Corporation Commission of Virginia has been asked to settle the dispute between the city of Norfolk and the Virginia Railway & Power Company over lines operating in Edgewater, a suburb of Norfolk. The city contends that the line is essential, but the company claims that it cannot be made to pay and should be abandoned. About a year ago the commission was asked to settle the controversy, and recommended that an attempt to reroute the line be made. For the last ten or twelve months both parties have discussed the matter but without reaching any agreement satisfactory to both, and the result is that the commission has been asked to take a hand again.

**Wages to Be Arbitrated.** — Having failed among themselves to reach an agreement on the wage question, the Trenton & Mercer County Traction Corporation, Trenton, N. J., and its employees have submitted the wage matter to arbitration. Albert S. Richey, Worcester, Mass., has been selected to represent the company, while James H. Vahey will appear for the men. Messrs. Richey and Vahey will choose a third arbitrator. The agreement between the company and men expired on April 1. As a result of conferences issues covering most of the working conditions have been adjusted, but the wage question remains unsettled.

**Given a One-Year Permit.**—The Atlantic Coast Transportation Company has been offered by the Asbury Park Board of Commissioners a one-year permit to operate buses at that place. To secure the permit the transportation company must agree to a 7-cent fare with transfers, conduct a ten-minute schedule and agree to permit the city to sanction the type of bus, which must be uniform. The Atlantic Coast Transportation Company, which is operated by the Atlantic Coast Transit Company, is capitalized at $100,000.

**B.-M. T. Publishes Map for Guidance.**—A new map and guide to all Brooklyn-Manhattan Transit lines has been published by the Brooklyn-Manhattan Transit Corporation. It was distributed for the first time at the opening night of the Brooklyn Industrial Exposition on April 5 to visitors at the B.-M. T. booth. The map and guide will be placed conspicuously in all the company's cars. The map is folded so as to be convenient to carry in pockets or handbags. The subway lines are printed in black and the elevated lines in red. On the reverse side of the map is a complete guide with the names of the stations and hours of service.

# Financial and Corporate

## St. Louis Net Higher

### Increase of $296,653 for 1923 Shown Over the Result for 1922—Congestion Becoming a Problem

Net income of the United Railways, St. Louis, Mo., for the year 1923 increased $296,653 over the year 1922. For 1923 the net was $809,745. For 1922 the net was $513,092. Gross operating revenue increased $489,889, from the sum of $19,963,555 in 1922 to $20,453,445 in 1923. It is explained in the printed report of the company for the year that all of the underlying bonds, aggregating $6,100,000, matured Oct. 1, 1923, and that the St. Louis & Suburban Railway general mortgage bonds matured April 1, 1923. It is further explained that the St. Louis Transit Company bonds mature Oct. 1, 1924, and the default in payment of the underlying bonds created a default in the United Railways general mortgage bonds due July 1, 1934. No interest has been paid on any of the bonds since Oct. 1, 1923, but interest has been accrued on the books to Dec. 31, 1923, at the rates provided by the mortgages or extension agreements.

No payments were made during the year on the liability of $2,396,321 for mill tax due the city of St. Louis, this amount being the balance of judgment obtained by the city against the company for mill tax to Dec. 31, 1918. The interest on this judgment, however, has been accrued on the books to Dec. 31, 1923, and the current mill tax has been paid regularly.

Provision for depreciation, renewals, etc., aggregated $1,500,000 for the year 1923, this amount having been fixed by a ruling of the Missouri Public Service Commission. Charges against the depreciation reserve during the year aggregated $788,998 and consisted principally of reconstruction of track and roadway, and retired equipment.

The surplus of the company as of Dec. 31, 1923, stood at $4,275,573, made up of a balance of $3,377,773 and $897,800 of additions during the year. The balance sheet of the company shows among the assets $5,341,150 of United States government bonds and treasury notes.

Rolla Wells, the receiver, points out that the total taxes and street paving costs for the year 1923 amounted to $2,287,048, or 0.781 cents per revenue passenger. In his review of the affiairs of the company the receiver explains quite fully the improvements carried out. Thus during the year 26.82 miles of track was reconstructed or renewed, fifty new cars were built, 113 cars were remodeled, shops and shop equipment were improved and the power supply augmented.

Mr. Wells says that the difficulty of operations in so-called "congested districts" has become more acute. He says that both the efficiency of the service and the expense of the company have been affected by allowing automobiles to be parked indefinitely in those districts, the lack of proper regulation of so-called service cars, the increasing number of passenger automobiles and freight trucks, and especially the permits granted by the Board of Public Service to buses to operate over certain of the heaviest lines of the street car traffic. Thus he says that the number of reveue passengers in 1923 (although seriously falling off in the latter part of the year) was 2.31 per cent greater than in 1922, and the largest in any year in the history of the company. On the other hand, for the purpose of improving the service, the car-miles increased 3.22 per cent, but due to the congestion mentioned the car-hours increased 4.35 per cent and the average miles per hour decreased 1 per cent.

During 1923 the work of equipping passenger cars with Economy watt-hour meters was completed. This work was begun in 1922. Mr Wells says that the results have been very gratifying. The total cost of installation (including equipment for testing and maintenance) was $105,944. The saving in power consumption per car-mile measured at the cars was 8.6 per cent and at the power house primary switchboards 5.8 per cent. On the latter basis the gross saving in cost of power was approximately $112,690. Liberally deducting a depreciating charge of 10 per cent on equipment and 7 per cent interest thereon and all costs for operating meters, maintenance, wages of instructors, inspectors, and clerks, the net saving for the year was approximately $78,293.

STATEMENT OF EARNINGS OF UNITED RAILWAYS, ST. LOUIS

| | 1923 | 1922 |
|---|---|---|
| Revenue from transportation | $20,220,765 | $19,740,118 |
| Revenue from other railway operations | 232,679 | 223,437 |
| Gross operating revenue | $20,453,445 | $19,963,555 |
| Current operating expense and depreciation | $15,123,183 | $14,895,508 |
| Taxes | 1,832,602 | 1,845,722 |
| Total operating expense, depreciation and taxes | $16,955,785 | $16,741,231 |
| Income from operation | $3,497,659 | $3,222,324 |
| Non-operating income | 225,700 | 202,830 |
| Gross income | $3,723,359 | $3,425,155 |
| Interest and miscellaneous charges | 2,913,614 | 2,912,063 |
| Net income for the year | $809,745 | $513,092 |

TRAFFIC STATISTICS OF UNITED RAILWAYS, ST. LOUIS

| | 1923 | 1922 |
|---|---|---|
| Revenue passengers | 292,671,781 | 286,076,475 |
| Transfer passengers | 155,343,193 | 152,261,868 |
| Total passengers | 448,014,974 | 438,338,343 |
| Percentage of revenue passengers using transfers | 53.08 | 53.22 |
| Average fare per passenger (including transfers) | 4.50c | 4.49c |
| Average fare per revenue passenger | 6.89c | 6.89c |
| Passenger car-miles | 45,652,714 | 44,229,300 |
| Revenue passengers per car-mile | 6.41 | 6.47 |
| Total passengers per car-mile | 9.81 | 9.91 |

With respect to the valuation, Mr. Wells says that on June 4, 1923, after more than four years of work on the valuation of the property in charge of the receiver, the Missouri Public Service Commission handed down its decision and order, fixing as of Jan. 1, 1919, the value of the property of the United Railways (including property of the Florissant Construction, Real Estate & Investment Company) at $52,838,110, and that of the Missouri Electric Railroad at $781,949. Petitions by both the city and the company for a rehearing are still pending before the courts, but developments since Mr. Wells made his report appear to indicate a settlement out of court.

## Tidewater Line at Birmingham Sold Under Foreclosure

Sale of the Tidewater line to the National Power & Light Company for $750,000 and the assumption of bonds and debts amounting to $1,675,000 was made by J. S. Pevear, special master, on April 15. The sale followed the negotiation of an agreement between representatives of the company and the members of the City Commission at Birmingham, Ala., permitting the rerouting of the line with a considerable amount of track abandonment. The purchase is presaged on the agreement being carried into effect by the city by April 19. The property was bid in for the National Power & Light Company by F. B. Odlum, acting for L. B. Hatch, who purchased the properties of the Birmingham Railway, Light & Power Company for the same concern.

Elimination of seventy-two railroad crossings at grade was effected by the track abandonment consented to by the members of the City Commission at the conferences. Changes agreed to by the City Commission, it is stated, will permit the Tidewater line to be made an integral part of the railway system and will enable the company to operate the portions of the line retained under the agreement on a self-sustaining and perhaps a profitable basis.

Operation of the Tidewater line has been in the hands of the Birmingham Railway, Light & Power Company and later in the hands of the receivers for several years. The line, according to officials of the company, has just about broken even on operation expenses, but has lost about $40,000 a year in depreciation of tracks and equipment. Lee C. Bradley and Mr. Pevear, co-receivers, stated to city officials that unless an agreement could be reached that would enable the reorganized company to take over and operate the useful portions of the line on a self-sustaining basis the entire line would have to be junked. The City Commission originally declined to consent to the changes asked, which are in the main the changes which were consented to in the agreement just adopted. Commissioner William L. Harrison wrote a letter offering the line to Henry Ford, but was later advised that Mr. Ford was not interested. The agreement was reached when the company representatives met the city's terms on through service, additional paving, the $75,000 payment for franchise revisions and track changes, and consented to retain certain trackage on the western end of the line which had originally been included in the plan for abandonment.

## Stockholders Seek Dissolution of Northumberland Property

Stockholders of the Sunbury, Lewisburg & Milton Railway, Sunbury, Pa., have voted to petition the court for a decree of dissolution of their corporation. With this action consummated, the property, which consists of a railway between the Sixth Street Junction, in Northumberland, of the Sunbury & Northumberland Street Railway and a point at the western end of the classification yards of the Pennsylvania Railroad, also in Northumberland, will be turned over to a trustee for sale. This line has been operated under the same management as the Sunbury and Selinsgrove lines.

The question of providing transportation for about 4,000 Pennsylvania Railroad employees, between the west end of the yards and the trolley junction, has not yet been solved, although a proposal has been made for establishing bus service between the two points.

## U. S. Supreme Court Acts in Clark Case

The United States Supreme Court has declined to review the decision of the Court of Appeals of Franklin County, Ohio, which awarded a verdict to Augusta M. Slaymaker and the Columbus Railway, Power & Light Company against E. W. Clark & Company, and others. Without comment, the Supreme Court on April 14 denied a petition for certiorari which would have brought this case on appeal before it.

## Deficit in Honolulu in 1923

The Honolulu Rapid Transit Company had a deficit in 1923 of $33,585. The total revenue from all sources in 1923 was $988,928, compared with $989,521 in 1922. Operating expenses in 1923 were $618,708 as compared with $602,757 in 1922. Passengers carried showed an increase of 5½ per cent over 1921 and an increase of 2 per cent over 1922. The report of the company for the year refers to the bus service started in the Kalihi district on Aug. 16, 1923. From that period up to Dec. 31, 1923, operations resulted in a deficit of $2,038. The improvements and extensions carried out during the past year under the program laid out in 1922 for the expenditure of $500,000 included track work, power installation, construction of six new cars and other miscellaneous improvements and additions.

President Castle said that the year 1923 had been a disappointing one in many respects. With the acceptance of the new franchise in February, 1922, the company was faced with the need of extensive and immediate improvements to its system. Already more than $550,000 had been expended on improvements to track and equipment, new capital expenditure which has been financed in part by a stock issue of $500,000. All of this work had not brought in corresponding increase in revenue. The present rate of return could not be maintained on a 5-cent fare upon present patronage. The results of operation in 1923 compared with 1922 are shown in the accompanying table.

| | 1923 | 1922 |
|---|---|---|
| Total revenue from transportation .............. | $978,433 | $973,129 |
| Total revenue from other railway operations .... | 10,495 | 16,392 |
| Gross revenue from operations .......... | $988,928 | $989,521 |
| Total operating expenses. | 618,708 | 602,757 |
| Net revenue from operations .............. | $370,220 | $386,764 |
| Total deductions ........ | 403,805 | 351,216 |
| Surplus .............. | *$33,585 | $35,548 |

*Deficit

## Net Income of Connecticut Company Smaller in 1923

The net income of the Connecticut Company, New Haven, for the year 1923 was $1,025,247. This is a decrease of $285,168 over 1922. Figures to this effect are contained in the statement of the affairs of the New York, New Haven & Hartford Railroad for the year ended Dec. 31, 1923. That company owns the entire $40,000,000 of capital stock of the Connecticut Company and $1,000,000 of debentures and $4,568,916 of the company's notes. This stock is in the hands of federal trustees, who under decree of the federal court shall exercise their best efforts to complete the sale of shares before April 1, 1925.

In commenting on the affairs of the Connecticut Company E. J. Pearson, president of the New York, New Haven & Hartford Railroad, says that while there has been a constantly increasing patronage of the cars in Connecticut, the percentage of increase in passengers has not been equal to the percentage of the reduction in the rate of fare made effective April 1, 1923. Mr. Pearson explains that it was necessary on June 1 to make effective an increase in rates of pay to all classes of labor, and the increased payrolls together with a decreased gross revenue resulted in a decrease in net for the year, the decrease becoming greater as the winter period approached. It was, therefore, necessary to announce an increase in the rate, effective Feb. 10, 1924, to three tokens for 25 cents, referred to previously in the ELECTRIC RAILWAY JOURNAL. The operating ratio in 1923 was 79.32 per cent, an increase of 2.11 per cent over 1922.

INCOME ACCOUNT OF THE CONNECTICUT COMPANY

| | 1923 | 1922 |
|---|---|---|
| Total operating revenues. | $14,717,233 | $14,477,611 |
| Total operating expenses.. | 11,673,454 | 11,177,594 |
| Net operating revenue.... | $3,043,779 | $3,300,017 |
| Tax accruals............ | 576,672 | 558,808 |
| Operating income......... | $2,467,106 | $2,741,209 |
| Non-operating income..... | 62,618 | 44,831 |
| Gross income........... | $2,529,724 | $2,786,040 |
| Deductions from gross income............... | 1,504,477 | 1,475,625 |
| Net income........... | $1,025,247 | $1,310,415 |

## Franchise and Financial Details Paramount in St. Louis

The directors of the United Railways, St. Louis, on April 8 ratified the appointment of an enlarged reorganization committee which will take up immediately the problem of refinancing the local railway, now in the hands of Receiver Rolla Wells. The new body will begin where the old committee of three members left off.

The head of that committee was Frank O. Watts, president of the First National Bank, St. Louis. He will be chairman of the new committee which is to have five members. Others on the new committee are to be J. K. Newman, president Newman, Saunders & Company, New York; A. L. Shapleigh, president of the United Railways Company (both members of the old committee); William P. Gest, president of the Fidelity Trust Company, Philadelphia, and J. Sheppard Smith, vice-president of the Mississippi Valley Trust Company. Mr. Gest was chairman of one of the protective committees for holders of St. Louis Transit Company 5 per cent bonds. In Mr. Smith the Mississippi Valley Trust Company will for the first time be represented on the organization committees. That institution is interested in a fiduciary capacity in the securities of both the United Railways and the St. Louis & Suburban Company.

Mr. Watts has said that no fixed plan can be announced at this time, as the ideas thus far developed by the reorganization committee must be submitted to the United States District Court, to the state commission and to the city administration.

As has been indicated previously it is contemplated that the $30,300,000 outstanding general mortgage 4's due in 1934 will remain outstanding, as the reorganization committee has been advised by counsel that there will be no permanent default in these bonds if certain legal requirements are met. Those requirements seem comparatively easy of performance. The financial plan will, therefore, be confined to the Transit 5's, Suburban general 5's, and to the preferred and common stocks. Necessarily, the receiver's certificates, the underlying bonds and other temporary or past due obligations will be provided for.

As Mr. Watts sees it the immediate undertakings of the reorganization committee are:

1. To determine with the Public Service Commission, the proper valuation of the properties for the purposes of reorganization.

2. To arrange for a new franchise which will insure proper service and protection to the car-riding public, and which will establish reasonable conditions of operations and define all matters necessary to be determined before reorganization can be accomplished.

3. To prepare and promulgate a financial plan acceptable to the city, the Public Service Commission, the court and the present security holders of the company.

Mayor Henry W. Kiel has declared in favor of an initiative election on a new blanket franchise for the company, which he contends must provide for payment of some $3,000,000 in back mill taxes now due the city.

Newman, Saunders & Company will shortly open an office in St. Louis and place experts at work on the reorganization details immediately.

## Earnings of Westchester High-Speed Line Improve

The New York, Westchester & Boston Railway, operating 57 miles of high-speed electric railway out of New York City into Westchester County, for the year ended Dec. 31, 1923, had gross revenues of $1,452,943, an increase of $98,934 over 1922, and balance after taxes of $247,172, equal to 25 per cent of annual interest charges on its $21,390,000 of 4½s, upon which interest is guaranteed and paid by the New York, New Haven & Hartford Railroad.

There was a deficit after charges for the year of $1,616,714, due to $886,727 interest on unfunded debt, chiefly on $16,300,000 notes and advances by the New Haven, in addition to rentals, miscellaneous charges and regular bond interest.

The Larchmont extension, which was put into operation early in 1921 at a cost of $418,500, has shown average annual net income since of $117,707 and for 1923 of $148,400.

## P. R. T. Seeks Approval of $1,000,000 Loan

The Philadelphia Rapid Transit Company, Philadelphia, Pa., has requested the city to approve a proposed $1,000,000 bond issue to retire $389,000 of the company's real estate mortgage bonds and to provide funds for necessary transit improvements. This request was contained in a letter to the Council from W. C. Dunbar, president of the company, on April 10. Its presentation was followed by the introduction of an ordinance by the chairman of the committee on transportation and public utilities providing for the city's assent. The subject was referred to his committee. Mr. Dunbar explained that the proceeds of this loan will be used to:

Retire mortgages now outstanding on various parcels of the company real estate, $389,000.

Construct track extensions to the new Southern carhouse now being built at Twentieth and Johnson Streets, $300,000.

Construct and equip a substation at Fox Chase, $90,000.

Add rotary converter at Ranstead substation, $40,000.

Provide emergency and utility equipment and house same, $81,000.

Purchase additional signals, shop facilities and equipment for Market Street elevated, $100,000.

## Another Step Taken in New Jersey Readjustment

Formal application has been filed with the Board of Public Utilities Commissioners of New Jersey for approval of a merger of the Public Service Electric Company, the United Electric Company and the Public Service Gas Company. At the same time approval was asked of a plan to change the 500,000 shares of the Public Service Railway of $100 par value into no par value stock, the shares to be exchanged par for par.

The merger is in line with the plans for financial readjustment to which reference has been made before in the ELECTRIC RAILWAY JOURNAL. The new company will be known as the Public Service Electric & Gas Company and will be controlled by the Public Service Corporation. The electric and gas company is expected to be the company to put out future new capital issues.

Assurance is given that the readjustment will not disturb the relationship which the corporation now bears to its subsidiaries or to the public, nor will it affect the holders of underlying gas, electric and railway properties except to improve their position by facilitating the development of the properties.

## Indianapolis-Louisville Line Does Well

The gross operating income of the Interstate Public Service Company, Indianapolis, Ind., for the year 1923 was $2,128,679 greater than for 1922, or 49.8 per cent. The net earnings for the last year were $466,698 greater than for 1922, or 48.5 per cent.

The railway department showed an increase in revenue over 1922. Heavy freight and express traffic made necessary the purchase of additional equipment, including three sleeping cars for service between Indianapolis and Louisville, two express motor cars, three express trail cars, ten live stock cars and two convertible ballast cars for use in track maintenance. The interurban tracks were extended into the Bourbon stockyards at Louisville during the year. This materially increased the live stock business. As many as 337 cars of stock have recently been handled in a month. During the year three parlor buffet cars were placed in service on the interurban line between Indianapolis and Louisville. This new service proved popular from the start and two additional cars of the same type are now under order.

STATEMENT OF EARNINGS OF INTERSTATE PUBLIC SERVICE COMPANY FOR YEAR ENDED DEC. 31, 1923

| | |
|---|---|
| Gross earnings, including merchandise sales | $6,405,343 |
| Operating expenses (including taxes) | 4,825,177 |
| | $1,580,166 |
| Miscellaneous income | 16,251 |
| | $1,596,417 |
| Rental of leased railway property | 165,898 |
| Net earnings | $1,430,519 |
| Interest on funded debt | 647,189 |
| | $783,330 |
| General interest and amortization of discount | 97,674 |
| Available for dividends | $685,656 |
| Dividends paid and accrued: | |
| Prior lien stock dividend | 250,461 |
| | $435,195 |
| Preferred stock dividend | 298,108 |
| Balance carried to surplus | $137,087 |

As for financial operations, the company retired its first and refunding mortgage, and in lieu thereof executed a new mortgage designed to finance the requirements of the company under existing conditions on more advantageous terms than the older mortgage executed some years ago. Under the new mortgage the company issued $8,192 000 in face amount of first mortgage and refunding gold bonds, Series A, using the proceeds to retire $4,048,000 in face amount of its first and refunding mortgage bonds and $3,044,000 in face amount of divisional underlying bonds of comparatively early maturities and to finance the cost of additions and extensions.

During 1923, the company also issued and sold $358,000, par value, of its preferred stock, and $335,000, par value, of common stock, and issued and delivered $2,000,000, par value, of common stock in connection with the acquisition of various properties in January, 1923. Also during the year $1,100,000, par amount, of prior lien stock was issued and delivered on account of and in connection with the acquisition of various properties in January, 1923; $211,000 par was issued and exchanged for certain outstanding general mortgage bonds of the company amounting to $211,000, and $1,524,700, par amount, of prior lien stock was issued and sold to investors, many of whom are customers of the company, and the proceeds used to pay or reimburse the cost of additions and extensions to the company's property.

The policy of offering the company's prior lien stock to customers, inviting them to become part owners of the company, has resulted in a wider personal interest in its affairs. The company's stockholders increased in number during the year from 1,980 to 4,485.

## Scaling Down Planned in Erie Reorganization

Details have been announced of the plan under which it is proposed to reorganize the Buffalo & Lake Erie Traction Company, Erie, Pa. It is proposed that the committee for the holders of the first and refunding mortgage 5 per cent thirty-year gold bonds, through its nominee, shall acquire all the property of the Buffalo & Lake Erie at foreclosure sales. Two new companies will be organized, designated in the plan as the Erie Company and the Interurban Company. The Erie Company will acquire the lines in the city of Erie and the Interurban Company will acquire the purely interurban line.

The Erie company will have a capitalization of $5,000,000 of 6 per cent first and refunding mortgage sinking fund thirty-year gold bonds, of which $1,000,000 are "presently issued"; $1,500,000 of 7 per cent cumulative preferred stock, of which $1,050,750 will be the initial issue, and 60,000 no par value shares of common stock. From the proceeds of $1,000,000 of the sinking fund gold bonds, and other moneys, the syndicate proposes to retire the receiver's certificates now a lien on the property of the Erie Company and to make available the $700,500 cash to be received by the committee. The property will be subject to mortgages and other secured debt.

The Interurban Company's capitalization is to consist of $1,500,000 of first and refunding mortgage 6½ per cent thirty-year sinking fund bonds, $800,000 of which comprise the initial issue; $1,500,000 of 5 per cent noncumulative preferred stock, of which $700,500 will be "presently issued," and

30,000 shares of no par value common stock.

On the basis that all bondholders assent to the plan each holder of a $1,000 bond of the Buffalo & Lake Erie will receive $150 par value of 7 per cent cumulative preferred stock of the Erie Company, amounting to 15 per cent of his holdings; 10 per cent in 5 per cent non-cumulative preferred of the Interurban Company, or a par value of $100; three shares of common stock of the Erie Company, no par value, having an estimated book value of $16.47 a share and aggregating $49.41, and $30 cash on the basis of an estimated available balance for this purpose of $218,900. In other words, each holder of a $1,000 bond will receive new stock of a par value of $299.41 and cash of approximately $30.

The company has been in the hands of a receiver since 1915.

## Cleveland Southwestern Wants to Issue Bonds

Application was filed with the Ohio Public Utilities Commission recently by the Cleveland Southwestern Railway & Light Company, Cleveland, Ohio, for authority to issue $4,500,000 in bonds and $4,000,000 in common stock for the purpose of consummating the reorganization of the company formerly known as the Cleveland, Southwestern & Columbus Railway.

Following an order of foreclosure sale by the Federal Court the properties were purchased on March 14 by John Fleek for Hayden, Miller & Company, who acted as reorganizing managers on behalf of all depositing bondholders. The sale was approved by the court, stockholders and directors.

The plan of reorganization calls for the issuance of securities substantially as follows: $800,000 prior lien twenty-five-year 6½ per cent bonds; $175,000 equipment trust certificates; $1,500,000 extended bonds comprising $200,000 Cleveland & Elyria thirty-year 6s, $100,000 Elyria & Oberlin thirty-year 6s, $127,000 Cleveland, Berea, Elyria & Oberlin thirty-year 6s and $1,073,000 Cleveland, Elyria & Western thirty-year 6s; $2,200,000 general and consolidated mortgage thirty-year 5s.

**Auction Sales in New York.**—At the public auction rooms of A. H. Muller & Sons there were no sales of electric railway securities this week.

**Loss for 1923 $65,593.**—The Fresno Traction Company, Fresno, Cal., reports to the Railroad Commission for the year 1923 that its operating revenue was $430,441 and operating expenses $344,739, giving a net operating revenue of $85,702. The net corporate loss for the year was $65,593. The deficit at the beginning of the year was $621,466. Miscellaneous additions to surplus for 1923 were $75,064 and miscellaneous deductions were $2,425, leaving an accumulated deficit at the end of the year of $614,419.

**Approves Track Removal.**—The New York Transit Commission announced on April 11 its approval of the proposed condemnation and removal of the tracks of the Sixth Avenue elevated road, at present running from Fifty-third Street to Fifty-ninth Street, and known as the Fifty-eighth Street spur. This will leave the Board of Estimate and Apportionment free to initiate the condemnation proceedings and start the work of removal as soon as it may desire.

**Power and Light Properties Included in Sale.** — The Warren-Jamestown Street Railway, Jamestown, N. Y., the Warren Street Railway, Warren, Pa., and the interurban line connecting Warren and Sheffield as well as extensive light and power systems of the Warren Traction Company have been sold to the Penn Public Service Corporation, which took over the electric railway properties as of April 10, 1924.

**Name to Be Changed.**—Steps have been taken by the Northern States Power Company in La Crosse to change the name of its largest division, the Wisconsin-Minnesota Light & Power Company, which supplies city and interurban railway service throughout a large territory in western Wisconsin, to the Northern States Power Company. Formal notice of the proposed action is contained in an amendment to the articles of incorporation of the company recorded recently.

**Seeks Partial Abandonment.** — The Stark Electric Railroad petitioned the Ohio Public Utilities Commission on April 8 for authority to abandon a part of its tracks in the city of Alliance. The application has been set for hearing May 12. The tracks proposed to be abandoned begin at the west side of Arch Avenue, running west on Main Street to Union Avenue, thence north to the right-of-way of the Cleveland and Pittsburgh tracks, thence on Vine Street.

**Suit to Compel Payment of Dividends Dismissed.**—The suit filed by holders of participation certificates of the Chicago Railways asking that dividends be ordered paid on certificates has been dismissed by Judge Cliffe of the United State District Court at Chicago. In his opinion Judge Cliffe held that "since the contractual obligations imposed by the plan of reorganization have not been violated, I must grant the motion to dismiss."

**Receiver Discharged at Binghamton.**—W. G. Phelps has been discharged as receiver of the Binghamton Railway, Binghamton, N. Y., by order of Federal Judge George W. Ray. Earnings of the company for 1923 are as follows: Gross, $1,073,723; net $325,733; interest and taxes, $217,107; balance, surplus, $108,626.

**Short Pennsylvania Line Sold.**—The Blue Ridge Traction Company, operating an 8-mile line, which connects Danielsville, Edgemont, Berlinsville, Walnutport and Slatington, Pa., was sold recently to H. Sofranscy Company, Allentown, Pa., junk dealers. It is believed that the new owners will scrap the line.

**Mortgage Gold Bonds Offered.**—Harris, Forbes & Company and A. C. Allyn & Company, Inc., New York, are offering at 100 and interest, yielding 6 per cent, $2,250,000 of refunding mortgage gold bonds of the Columbus Railway, Power & Light Company, Columbus, Ohio. They are known as the 6 per cent series due 1941. The bonds are dated Dec. 1, 1921, and are due Dec. 1, 1941. The Columbus Railway, Power & Light Company does practically the entire commercial electric light and power business in Columbus and vicinity, and does the entire railway business in Columbus.

**Seeks Authority to Abandon in Palo Alto.** — The Peninsular Railway has applied to the California Railroad Commission for authority to abandon its street railway system in Palo Alto and adjoining territory lying north of the Southern Pacific Company's tracks and to remove the tracks and equipment. The railway had a loss of $8,538 on these lines during 1923 and $12,523 during 1922. The deficit for its entire system for the year 1923 was $377,737.

**Representatives of Bankers on Board.**—At the annual meeting of the Public Service Corporation of New Jersey, on April 7, Alfred L. Loomis and Landon K. Thorne of Bonbright & Company, New York, were elected to the board of directors. Bonbright & Company have been identified with the recent financing of the company.

**Deficit in New Jersey Slightly Larger.**—A deficit of $126,922 was reported by the Public Service Railway, Newark, N. J., for February, compared with a deficit of $112,823 in February, 1923. The company is operating under a temporary schedule which provides within the limits of the larger cities served a 5-cent fare with an additional 5-cent charge in the suburbs, no transfers. In all other parts of the territory the rate of 8 cents, four tokens for 30 cents, 1 cent transfer, continues.

**Authorizes Bond Issue.** — The Key System Transit Company, Oakland, Cal., has been authorized by the Railroad Commission in a supplemental order to execute a deed of trust to secure the payment of its general and refunding mortgage bonds amounting to $20,000,000, and to issue $8,951,000 of such bonds, $1,365,800 bearing interest at the rate of 6 per cent per annum, and $7,585,200 at the rate of 5 per cent per annum, and to use the proceeds to refund outstanding obligations.

**Abandonment of Three-Mile Line Approved.**—The Public Service Commission, under an order issued April 9, approved the declaration of abandonment by the Huntington Traction Company, Inc., of that part of its line in Huntington, L. I., south of the Long Island Railroad extending along the highway from Huntington to Siding No. 7, a distance of 3 miles, on the understanding that the railroad is to remove all of its structures and place the highway in good condition. The railroad is to continue between the north side of the Long Island Railroad and Halesite. It was asserted at the hearing that if any abandonment is to be permitted, the railroad should not be allowed to retain that part of its line north of the Long Island Railroad in Huntington. The commission holds that so far as this contention is concerned, the evidence is that public interest requires the continued operation of this part of the road, and further, that the commission has no power to compel a street railroad to abandon a portion of its route without its consent.

# Personal Items

## Mr. Greenland Goes to St. Louis

### Fort Wayne Official Retained to Assist in Extensive Work to Be Done in Connection with Reorganization of the United Railways

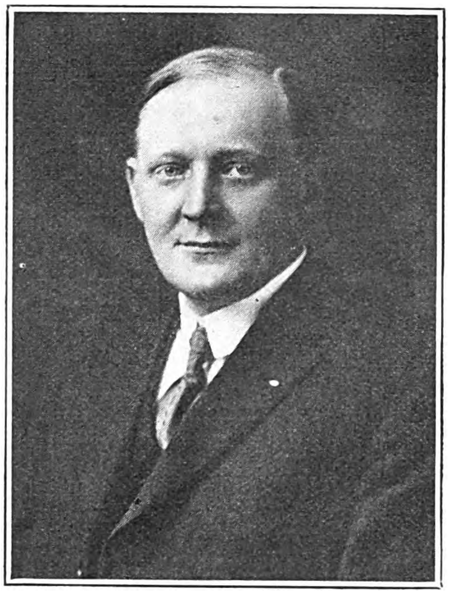
SAMUEL W. GREENLAND has resigned as vice-president and general manager of the Indiana Service Corporation, Ft. Wayne, Ind., effective May 15, to go to St. Louis as the representative of Newman, Saunders & Company, Inc., New York, to assist them in their work as agents of the reorganization committee of the United Railways. That firm has recently opened offices in St. Louis. The company with which Mr. Greenland is now connected owns and operates the electric railways in Ft. Wayne, Wabash, Peru and Logansport and the interurban lines connecting Fort Wayne with these cities and with Lafayette and Bluffton, Ind., and does a general power and lighting business. In addition to his connection with the Indiana Service Corporation Mr. Greenland is general manager of the Ft. Wayne & Decatur Traction Company and holds a similar position under the receiver of the Ft. Wayne, Van Wert & Lima Traction Company.

#### IMPORTANT WORK AHEAD

Mr. Greenland's duties at St. Louis have not been specifically defined. There is a vast amount of work to be done in connection with the lifting of the receivership of the United Railways there, and it is to this that Mr. Greenland will at first apply himself. The most important matters to come up immediately are the valuation and franchise questions, with which of course are interwoven the preparation and promulgation of the details of the financial reorganization, in working out which the interests of the city, the public service commission, the court and the present security holders will all have to be reconciled so that the future may best be served.

To the part in this work which Mr. Greenland will take he will bring a combination of exceptional natural talent and a knowledge of utility problems extending over a period of twenty-five years. He is one of the outstanding figures among Middle West railway men, because of his progressiveness in modernizing the operation of the Ft. Wayne properties. A very important piece of work here was his part in the complete recasting of the financial structure of the Ft. Wayne & Northern Indiana Traction Company and the organization of its successor, the Indiana Service Corporation. It seemed like a bitter pill for many of the local security holders to have to accept new substitute securities, with greatly reduced face value, for their former paper. But they had faith in the management and, even though reluctantly, came in on the plan and made possible the initial step toward turning the near-bankrupt property into one able to provide first-class service and make a nice profit on the railway as well as the lighting service.

Since the reorganization, the property has been very nearly wholly re-equipped and rebuilt with the best of rolling stock and increased power facilities, including a changeover to 100 per cent 60-cycle service, doing away with all 25-cycle energy.



S. W. Greenland

In the merchandising of transportation Mr. Greenland has also shown his progressiveness. He was quick to see the virtues of the weekly pass as applied to the conditions confronting him and he has been able to turn that to advantage as a revenue producer and as a means of cementing still closer his friendly relations with the public. And aside from the mechanics of the job, Mr. Greenland has been unusually successful in his relations with his employees, and has in addition made himself a real factor in all the progressive work of the community.

So far as his new work at St. Louis is concerned, it would appear that the future there for him is what he makes it. That being so, Mr. Greenland may be expected to make that future something distinctly worth while to the people of St. Louis and to the investors in that railway.

Mr. Greenland was born at Clarion, Pa., on April 27, 1879. He was educated at the Pennsylvania Military College, Chester, Pa., and at Penn State University, where his work in electrical engineering was concluded in 1900. His first job in the utility field was with the Bell Telephone Company at Pittsburgh in connection with construction work. In 1904 he became connected with Robert W. Watson, consulting engineer, Harrisburg, Pa., where for three years he was engaged principally in making engineering reports for financial interests. In 1907 he became general manager of the Columbus Railway, Light & Power Company, which furnishes the gas, electric light and railway services in Columbus, Miss. At the time the Wabash Valley Traction Company was reorganized to become the Fort Wayne & Northern Indiana Traction Company, in 1911, he went to Fort Wayne as assistant general manager and later in the same year was made general manager. Upon the reorganization of this company into the Indiana Service Corporation in 1920 he was elected vice-president as well as general manager.

#### FORMER SECTIONAL ASSOCIATION HEAD

Mr. Greenland has been active in the Central Electric Railway Association and served as its president during 1922. In 1917 he served as president of the Indiana Electric Light Association. He is a member of the American Institute of Electrical Engineers and the American Society of Mechanical engineers. During the war he was a major in the chemical warfare section of the army and had charge of the erection of a 20,000-kw. steam generating station at the Edgewood (Md.) Arsenal. He also looked after the operation of the utilities at Edgewood.

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**W. W. Nielson**, assistant to A. E. Reynolds, vice-president and general manager of the Springfield Gas & Electric Company and the Sprinfield Traction Company, Springfield, Mo., has been promoted to assistant general manager of the Tucson Gas, Electric Light & Transmission Company, Tucson, Ariz.

**Charles A. Blose**, assistant line superintendent of the Indiana, Columbus & Eastern Traction Company for several years, has been appointed superintendent of lines, taking the place made vacant by the transfer of C. R. Holland, former superintendent, to a similar position with the Columbus, Newark & Zanesville Electric Railway. Mr. Blose will establish offices at Zanesville.

**E. M. Ashworth** has been appointed general manager of the Civic Hydro-Electric Commission of Toronto. At the time when the new Toronto Transportation Commission first met in the fall of 1920 Mr. Ashworth, then secretary and assistant general manager of the Hydro commission, was temporarily appointed secretary. At that time P. W. Ellis was unanimously chosen chairman.

**Albert C. Spencer**, engineer of way of the Toronto Transportation Commission, has become assistant general manager of the commission, which is responsible for the operation of the municipal railway lines in Toronto.

## W. C. Lincoln with Electric Service Supplies

### Goes to Chicago from National Railway Appliance Company to Become Western Sales Manager

Willis C. Lincoln has been appointed Western sales manager of the Electric Service Supplies Company with headquarters in that company's Chicago office. Mr. Lincoln has resigned from his former connection as manager of sales and engineering for the National Railway Appliance Company, New York.

Willis Lincoln is well known in the electric railway, the steam railroads and the mining fields. He was one of the first engineer salesmen in the railway field. In fact, he applied his early selling instinct to help finance himself through Union College. With money which he earned by two years sales work with the Brewer-Pryor Piano Company, Mr. Lincoln studied electrical engineering at Union University under the late Dr. Steinmetz, then head of that department of the university. Theory was all right, but Mr. Lincoln wanted practical experience. To get that he entered upon the regular test course of the General Electric Company just as soon as he finished at the university. Next he went with the consulting engineering department of that company. Later he entered the railway engineering department.

W. C. Lincoln

### Mr. Lincoln in Selling End

Mr. Lincoln's next work for the company was at selling. This was a logical step, equipped as he was to talk in terms of performance and not in terms of appearance. And so he packed his grip as a sales engineer and covered several states for several years backed by an accurate knowledge of the material his company handled.

When the war broke out in the year 1914 Mr. Lincoln resigned his position with the General Electric Company to take charge of the engineering department of the Railway Improvement Company, New York. Later, as manager of sales and engineering of this company, his knowledge of selling was still further broadened, for with that company he had entire charge of marketing the company's products intended for use by steam and electric railways and in mines and other industrial plants.

## J. O. Wilson Resigns from Cleveland-Southwestern

A quarter of a century of service with the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, is the record of J. O. Wilson, who resigned, effective April 15, to accept a position as executive president of the Harvard Savings & Loan Company and the Harvard Mortgage Company. Mr. Wilson started in as a clerk in 1899 with the Cleveland-Southwestern properties, and worked his way up through almost every department to the executive position of secretary and treasurer, which position he held at the time of his resignation.

**Alcide E. Beauvais** has been elected president of the Montreal Tramways & Power Company, Montreal, Que., succeeding William C. Finley. E. A. D. Morgan and Evariste Champagne have been elected directors. The vice-presidency has not yet been filled and there remain three vacancies on the directorate.

**J. E. Heston,** formerly superintendent of shops of the Interstate Public Service Company at Scottsburg, Ind., has resigned, effective May 1, to enter other fields of work. Mr. Heston entered the service of the Union Traction Company of Indiana in September, 1900, and with the exception of two and one-half years, when he was in the service of the Winona Interurban Railway, was with that company continuously until May 15, 1923. It was on that date that he entered the service of the Interstate company.

**Albert Swartz,** formerly a receiver for the Toledo & Western Railroad, Toledo, Ohio, has been retained by the successor company and will have complete charge of operations. He was vice-president of the Community Traction Company at its beginning and previous to that time was in the employ of the Toledo Railways & Light Company and the Toledo & Western Railroad. He served a short time in the New York offices of Henry L. Doherty & Company, New York, after graduation from Toledo schools. His preliminary engineering work was done on railroads near Toledo. Mr. Swartz will continue to reside in Toledo. He will have his offices at Sylvania, at which place the headquarters of the Toledo & Western are located.

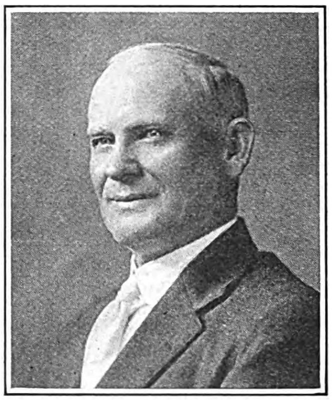
**L. Sommers,** formerly superintendent of way, subway and elevated division of the Philadelphia Rapid Transit Company, Philadelphia, Pa., has recently been appointed assistant operating manager of the subway and elevated division. C. C. Haney has been made operating manager.

**Raymond Page** has become manager of the Hornell Traction Company, Hornell, N. Y., following the vote of the bondholders to have the interests of the company turned over to Mr. Page and W. C. Whitaker. Robert W. Bull retires as receiver.

## John R. Marshall Promoted in New Brighton

John R. Marshall, chief dispatcher of the Beaver Valley Traction Company and the Pittsburgh & Beaver Street Railway, New Brighton, Pa., has been advanced to the position of superintendent of transportation. The appointment of Mr. Marshall followed the change in general managership made effective when W. H. Boyce accepted the position of commercial manager with the Pittsburgh Railways and was succeeded at New Brighton by Clinton D. Smith as general manager.

Mr. Marshall has been with the company since 1902. In his early years of association with the Beaver Valley company he accepted a job as motorman at the request of John Buchanan, then president of the Beaver Valley Traction Company. For three years he operated a car, at the same time learning the duties of a conductor. Later he was advanced to assistant dispatcher. A year after he was made chief dispatcher, and it is this position which he now vacates to become superintendent of transportation.



J. R. Marshall

Mr. Marshall was born on a farm on April 6, 1869. He has always made Beaver County his home. He attended the country schools, but as the oldest of eight children, he early obtained a job and board on a farm. His next venture was turning a boring wheel for ten hours a day at a wage of 50 cents a day. He spent seven years in a lumber camp and two years as a tool dresser and teamster in the oil fields of Butler County. Mr. Marshall's father died in 1897 and for five years thereafter he conducted the homestead farm. Later he moved to Beaver with his mother.

## Obituary

### J. S. Simpson

J. S. Simpson, auditor of the Washington Water Power Company and the Spokane United Railways, Spokane, Wash., died very suddenly on April 5, following an attack of apoplexy. He had been connected with the companies since 1918. Before that Mr. Simpson was chief accounting officer of the Washington Public Service Commission. Mr. Simpson was born at Greenland, N. H., in 1871. His first business connection was with the Thomson-Houston Company at Boston. He remained with that company and its successor, the General Electric Company, until 1901. In that year he went to Tacoma to enter the employ of Stone & Webster. D. L. Huntington, president of the enterprises of which Mr. Simpson was an officer, said that "not only had the companies lost a valuable man, in the death of Mr. Simpson, but that the city and the Inland Empire had lost a real friend."

### J. E. Barhite

John E. Barhite, for eleven years special County Judge of Monroe County and a member of the Public Service Commission for the Second District of New York from 1917 to 1921, died in Rochester on April 2. He was appointed Public Service Commissioner by Gov. Charles S. Whitman upon the recommendation of the late George W. Aldridge, Rochester, Republican leader. Mr. Barhite was sixty-seven years old.

**Lyman K. Brown**, for many years treasurer of the Fonda, Johnstown & Gloversville Railway, Gloversville, N. Y., died recently at the age of seventy-five years.

**Frank M. Harris**, treasurer of the Des Moines City Railway, Des Moines, Iowa, died recently. He had been connected with the Des Moines City Railway since 1897. At the time of his death he was treasurer and general purchasing agent for the company. Mr. Harris was born in the city of Cleveland, Ohio, in 1865.

**William C. Hawkes**, seventy-nine years old, of Dorchester, died recently at Newton, Mass. Had it not been for a brief period when he was away from Boston, he would have had a record of the longest unbroken service with the Boston Elevated Railway. His first railway connection was with the old Lynn & Boston. Later he became connected with the Highland Street Railway, Boston.

**Andrew L. Campbell**, formerly chief of the electrical repair department of the United Electric Railways, Providence, R. I., died recently. He was first employed at the power station and later was placed in charge of substations. He had been with the company twenty-seven years.

**John Freeman**, formerly in the employ of the Northern Ohio Traction & Light Company, Akron, Ohio, died recently at the age of sixty-three years. He entered the service of the company in 1897 as motorman on the Akron city division. One year later he was appointed inspector. Later Mr. Freeman was transferred to New Philadelphia in charge of the lines in that section. Following this assignment he went to Canton as assistant to D. A. Scanlon, then superintendent of the southern division. In 1917 he was retired from service. He was the father of O. L. Freeman, present Akron city superintendent.

# Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

### Further Reduction in Varieties of Paving Brick

At a meeting of the permanent committee on simplification of varieties and standards of vitrified paving brick of the United States Department of Commerce, held in Washington, D. C., March 28, the recognized types and sizes of vitrified paving brick were reduced from six to five. Since the first conference on paving brick simplification was held Nov. 15, 1921, manufacturers throughout the country have reduced the number of types and sizes of vitrified brick used for highway paving and street track paving from sixty-six to five.

The recognized types and sizes as determined upon by the committee through a process of elimination over three years are: Plain wire cut brick, 3 in. x 4 in. x 8½ in. and 3½ in. x 4 in. x 8½ in.; repressed lug brick, 4 in. x 3½ in. x 8½ in.; wire cut lug brick, 3 in. x 3½ in. x 8½ in. and 4 in. x 3½ in. x 8½ in.

The one type and size eliminated by the committee at its last meeting was the 3½-in. x 3½-in. x 8½-in. wire cut lug (Dunn). This elimination, like all eliminations that have taken place since the work of simplification was taken up by the committee, was determined upon only after a survey of the industry's shipments revealed that certain sizes had steadily declined in favor among engineers of the country to a point where they constituted an exceedingly small percentage of the total shipments of the industry.

For guidance at this and future meetings the committee adopted a resolution to the effect that "any variety of brick which shows less than 2½ per cent of total shipments for three consecutive years be eliminated and that any variety of brick which shows 5 or more per cent of the shipments for three successive years be reinstated in the list of recognized types and sizes unless special technical or other reasons show that such action is undesirable; provided, further, that the recognized types and sizes shall represent not less than 75 per cent of production."

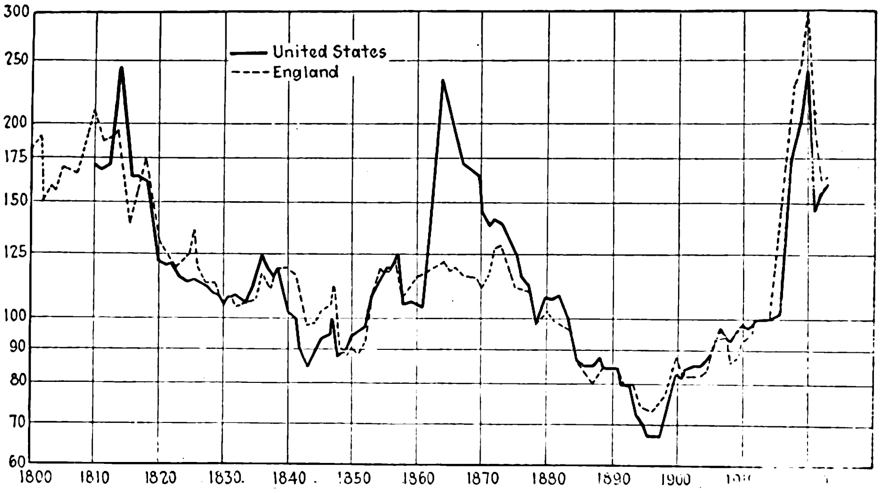
The survey of the paving brick industry made in connection with the simplification conference reveals the fact that the industry has experienced a steady growth since the year of lowest production in 1918. In 1923 shipments reached the high figure of 453,864,183.

### G. E. First Quarter Orders Show Decrease

Orders received by the General Electric Company, Schenectady, N. Y., for the three months ended March 31 total $73,487,903, Gerard Swope, president, announced recently. This is a decrease of 8 per cent over the first quarter of 1923, when orders totaled $80,010,045.

### Commodity Prices Here and in England Since 1810

In testifying in the International Railway valuation case, referred to in the ELECTRIC RAILWAY JOURNAL, issue of April 12, Dr. Jacob H. Hollander, professor of political economy in Johns Hopkins University, presented the originals of a number of charts in support of his conclusions. Among them were studies showing the trend of prices in the United States from 1913 to 1923, bank credit, gold reserves and federal reserve notes, 1919-1923; prices in the United States, 1913-1923; production in basic industries and volume of business, 1919-1923, and commodity prices in the United States, 1810-1923, and in England, 1800-1923, the last reproduced herewith.



Commodity Prices in the United States, 1810-1923, and England, 1800-1923. Prices in 1924=100

## Electric Drills Reduced in Price

An increased rate of production, resulting from the greater demand for electric tools, has enabled the Hisey-Wolf Machine Company, Cincinnati, to reduce its prices. The new price list became effective on March 17. Electric drills of the more popular sizes have been reduced in price from 12½ per cent to 17 per cent. Other reductions range from 5 to 10 per cent.

## $22,988 Awarded to 1,752 General Electric Workers for Suggestions

Awards totaling $22,988 were paid to 1,752 employees of the General Electric Company during 1923 for suggestions which increased the efficiency of the company's operations. The suggestions ranged from safety devices for the protection of workers to improved methods of manufacturing electrical apparatus. The highest awards amounted to $500.

During the year 8,078 suggestions were filed, representing about one-tenth the employees of the company. The Philadelphia works leads, with 43 per cent of its workers offering suggestions, and the Edison Lamp Works at Harrision, N. J., tops the list in suggestions accepted, with 48 per cent.

Suggestions are sent to a special committee in each works. This committee investigates the suggestion, passes upon the merit and either makes an award to the man or woman who made the suggestion or explains why the suggestion cannot be effectively adopted. In most cases the award is made within a few weeks after the suggestion is received.

## Metal, Coal and Material Prices

| Metals—New York | April 15, 1924 |
|---|---|
| Copper, electrolytic, cents per lb. | 13.475 |
| Copper wire base, cents per lb. | 15.875 |
| Lead, cents per lb. | 8.15 |
| Zinc, cents per lb. | 6.38 |
| Tin, Straits, cents per lb. | 49.25 |
| **Bituminous Coal, f.o.b. Mines** | |
| Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons | $4.20 |
| Somerset mine run, Boston, net tons | 2.35 |
| Pittsburgh mine run, Pittsburgh, net tons. | 1.875 |
| Franklin, Ill., screenings, Chicago, net tons | 2.175 |
| Central, Ill., screenings, Chicago, net tons. | 1.90 |
| Kansas screenings, Kansas City, net tons.. | 2.50 |
| **Materials** | |
| Rubber-covered wire, N. Y., No. 14, per 1,000 ft. | $6.65 |
| Weatherproof wire base, N.Y., cents per lb. | 17.50 |
| Cement, Chicago net prices, without bags. | $2.20 |
| Linseed oil (5-bbl. lots) N. Y., per gal. | $0.93 |
| White lead, in oil (100-lb. keg), N. Y., cents per lb., carload lots | 12.25 |
| Turpentine, (bbl. lots), N. Y., per gal. | $0.99 |

## *Rolling Stock*

**Menominee & Marinette Light & Traction Company, Menominee, Mich.,** proposes to buy seven new cars at a cost of $50,000.

**Grand Rapids Railway, Grand Rapids, Mich.,** is planning the purchase of twenty new cars.

**Department of Street Railways, Detroit, Mich.,** has just awarded contracts for seventy-five new Peter Witt type cars and will ask for ten new three-car trains similar to the one which has been tried out on the Detroit city lines and is now in operation on Woodward Avenue. Although bids have been asked for 100 new Peter Witt type cars of the large model, contracts were awarded for only seventy-five, street railway officials having decided, after the favorable results obtained from the three-car train, to ask for bids on ten such trains, thus making 105 new cars in all, counting the Peter Witt cars.

## *Track and Line*

**Pacific Electric Railway, Los Angeles, Cal.,** will shortly start extending its track through the heart of Belmont Shore Place and Naples, by way of Second Street. Approximately 7,000 ft. of track will be laid, beginning at Livingston Drive, bridging Alamitos Bay and continuing on through Naples to connect with the Newport-Los Angeles line.

**Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich.,** has doubled its trackage on the docks at Grand Haven.

**Toronto Transportation Commission, Toronto, Canada,** has already assigned employees to the rearrangement of poles and wires necessary to permit the laying of the curves which will connect the Parliament Street line with the Bloor Street tracks. The rails will be connected with the Bloor Street line and with the loop, which will be built on the plot of land lying east of Parliament and immediately south of the viaduct. It is expected that track laying will start soon and that the loop will be in use within a month.

**Seattle Municipal Railway, Seattle, Wash.,** may build an extension of the Cowen Park line if the petition recently put before the City Council meets with approval. City Engineer J. D. Blackwell estimates the cost of the proposed extension at $125,000, which would pay for the laying of a double track from the present terminus of the line to East Sixty-fifth Street, and for the laying of a single track from East Sixty-fifth Street to Bothell Way, the proposed new terminus. This estimate includes a trestle across the park gulch. For the $125,000 expenditure, 2,100 50-ft. blocks would be included in the assessed district.

## *Trade Notes*

**Ohmer Fare Register Company, Dayton, Ohio,** in order to complete the acquisition of the American Taximeter Company, New York, and to meet the demands of the company's fast-growing business, has arranged with Spitzer, Rorick & Company, Toledo, for an offering of $600,000 of the 7 per cent serial gold notes. The notes, offered at 101 and interest, are dated April 1, 1924. The American Taximeter Company manufactured a taximeter of the non-recording type which will hereafter be manufactured by the Ohmer Fare Register Company. The plan for the acquisition of this property by the Ohmer Fare Register Company was described in detail in the ELECTRIC RAILWAY JOURNAL, issue of March 15, page 437.

**Yale & Towne Manufacturing Company, Stamford, Conn.,** recently appointed Herbert Charles Rahm advertising manager. In this capacity he succeeds Francis Juraschek, who resigned to enter business for himself. The new advertising manager's first position was as clerk in the advertising department of P. & F. Corbin in New Britain, Conn. In 1915 he received an offer from Sargent & Company to enter its service. Here he took care of all the catalog work. In September, 1922, he went with Yale & Towne as assistant advertising manager. Since August of last year he has been in full charge of the advertising department owing to the continued illness of Mr. Juraschek.

**William Lintern,** president of the Nichols-Lintern Company, Cleveland, has made a business trip to New England and the Eastern cities. He reports his trip productive of much valuable data relative to the new stop-light which his firm is about to place on the market. He promises a definitive advance, in the shape of a highly simplified system, which will reduce installment and maintenance costs to a minimum.

## *New Advertising Literature*

**Century Wood Preserving Company, Pittsburgh, Pa.,** has issued a bulletin on the "Shipley Treating Unit." The bulletin describes the effectiveness, advantages, construction and capacity as well as uses and availability of the "Shipley Treating Unit."

**Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.,** has recently published a new booklet, known as Folder 4532-A, dealing with Westinghouse fabrics and papers for insulating purposes. All the forms of treated and untreated fabrics, papers, sleeving, tapes, cord and thread manufactured by the company are fully described in the booklet and their principal applications given. The materials described in this folder are used in the manufacture of Westinghouse electrical apparatus and made available to the general trade.

**Crouse-Hinds Company, Syracuse, N. Y.,** has issued folder No. 12 entitled "Condulets for Concealing in Concrete."

**Detroit Electric Furnace Company, Detroit, Mich.,** has just issued a new publication on brass melting. This booklet tells, first, that the electric furnace is a factor of ever increasing value in brass melting. It next enumerates the economies effected by the electric furnace, and then shows how complete control of analysis, color, texture and homogeneity of the alloy is secured through the electric furnace.

**Page & Hill Company, Minneapolis, Minn.,** has issued a new publication called "Practical Information About Cedar Poles and Butt-Treating." This handbook covers information on the storage of poles, painting of poles, the proper and improper methods of unloading cars, counting and tallying and other practical data for use of engineers, purchasing agents, yard superintendents, foremen and foremen of line crews.

New York, April 26, 1924

# Electric Railway Journal

*Consolidation of Street Railway Journal and Electric Railway Review*
Published by McGraw-Hill Company, Inc.
HENRY W. BLAKE and HARRY L. BROWN, *Editors*

*Volume 63*
*Number 17*

## Accurate Schedules Demand Accurate Time

WITH steam railroad men accurate timepieces are traditional, and are looked on as a matter of course. Not only are high-grade movements demanded, but the timepieces used in railroad work must be examined periodically by competent inspectors and their accuracy certified.

Some street railway managers are prone to believe that similar accuracy of timepieces is not necessary on their roads. This is on the theory that slight deviations from the schedule are not of prime importance, and that it is the duty of inspectors stationed along the line, along with their other activities, to keep the cars properly spaced and on time.

Headways on a large city system are usually quite close, especially on trunk lines, where a number of routes converge, and it is folly to try to space out the cars on the street if they do not start from their terminals on time. Where the headway is, say, 2 minutes, if a car is 1 minute behind its schedule because the motorman's watch is a minute slow, and the one due next is 1 minute ahead, due to a watch a minute fast, they would run together, and there would be a gap of 3 minutes on either side of them, or 50 per cent above the proper spacing. The car due later might even arrive at the junction first, and so get ahead of its scheduled leader.

A joint headway of 2 minutes is not particularly frequent service, and nearly every American city of any size has at least one such line. The bunching of cars started in this manner is likely to be cumulative. One or two cars off time at the beginning of the rush hour might easily derange the entire service during this period. It is not always unavoidable delays that cause the irregular spacing.

Some roads have a practice, similar to that of the steam railroads, of requiring the men to purchase good watches and have them inspected. While ordinarily street car men do not have a large surplus of funds, a good watch should be considered an essential of the business. Arrangements usually can be made to purchase the watches on the installment plan, and as it is only the quality of movement that matters, the burden is not particularly onerous.

In line with the same policy, standard clocks should be provided at carhouses or other central points, against which the men should be required to check their watches daily, thus synchronizing time on the entire system and preventing any argument as to the correct time. And no alibis should be accepted from trainmen whose watches are inaccurate.

The policy of having the time for a road standardized is just one of the big little things that go to make the difference between good service and indifferent service. As a means of merchandising transportation there is nothing like dependable service, with the cars always on time. Accurate timepieces are the first and a fundamental requisite in such a program.

## Railway Conventions for Railway Men

OUR conventions have come to be too much of a character designed to get publicity for the railway man's point of view. While this is desirable to a certain extent, it is somewhat of an imposition on a busy man's time to have to listen to papers and addresses directed not to him, but to the general public, he merely helping to make up the scenery and the occasion for putting this message out to the public.

In this suggestion, there is not the least intention to belittle the importance of good publicity, nor the effort to get all the good out of a meeting, in a publicity way, that can be. But there are ways of doing this without turning conventions for railway men into conventions for the general public; for example, by planning greater publicity for talks of railway men before layman type audiences.

## More Outside Point of View Needed

AS ATTENDANTS at numerous railway conventions, the editors of this paper have been impressed with the desirability of bringing in more speakers with an outside point of view. There is a rather natural tendency for railway men to tell each other their problems and consult about them, all from an inside point of view. This is productive of considerable mutual helpfulness, especially with respect to mechanical and operating problems. But on the broader, less tangible problems, such as public relations, they are all attacking them from about the same angle, for their thinking is much along the same lines. They confer, and, agreeing, part without having gained materially.

What would be helpful here, perhaps, would be to have speakers who would present some ideas from the car rider's point of view. Most every layman has ideas on how to run the railway. Some of those ideas, if coming from a man of reputation, might be quite worth the time of a railway man to hear. They might not always make the best publicity—and yet, the railways have nothing to conceal nowadays, and if a condition does exist which would not look well in print, it ought to be corrected anyway, or if it cannot be, then the company doubtless has a reason that will constitute a satisfactory explanation, and the news about the matter would give an opportunity to get that reason before the public.

Would it not be fruitful to invite a prominent newspaper man to speak to a railway convention now and then, even though he might represent an anti-traction paper? Perhaps he would disclose something of his reasons for antagonism—some motive that had not occurred to the railway men. This would then suggest a way to correct a misimpression on his part, or a fault on the part of the railway.

### House Organs as Mediums for Railway Publicity

ANOTHER good way to get the story of the local electric railway before a part of the public is to prepare short articles for some of the numerous little publications of the "house organ" type. Almost every large organization nowadays has some sort of magazine which is circulated to the employees. These organizations include manufacturing concerns, department stores, the police department; automobile, golf, political and athletic clubs; federated women's clubs, and so on. Such papers are often in need of an article or two on some good, live topic. And they are not troubled with the general publicity that floods every newspaper office. They may not reach a host of readers, but to their limited audiences they have an especial appeal—that associated with company or club interest and backing. Such mediums are numerous, and taken as a whole, they form a very worth-while means of spreading the true story about railway service.

### Giving the Pedestrian a Show Should Benefit the Railway

TRAFFIC problems nowadays are considered principally from the standpoint of the street car and the motor vehicle. The discussion usually comes down to whether the motor car should use the streets to the exclusion of other traffic, or whether the street car should be given precedence over vehicles.

There is, however, a silent sufferer who loses no matter what the decision—the pedestrian. Street congestion is getting so bad in most urban business centers that it is exceedingly difficult for him to make his way across the intersections.

Some cities go farther than to consider the pedestrian a pest. They legislate against him to the extent that he must cross the streets at certain designated points, and then only when the traffic signal is set properly for him. Even so, there are vehicles making right-hand and left-hand turns that interfere with his movement and make it dangerous for him.

A speaker recently pointed out that there is a connection between the street railway and the pedestrian, in that except for the pedestrians on the congested streets there could be no surface car system. Railway managers are importuned to tell the motor car owner to leave his automobile home and ride the street cars. It must not be forgotten that this carries with it a certain obligation to make it safe and convenient for the same person when he leaves or boards the street car, wherever that may be. Certainly if he cannot feel that he is safe afoot, he will prefer to drive his own machine with its attendant risks rather than walk on the streets and take a chance against other vehicle drivers.

With this idea in mind, street railway men can justify time spent in campaigns for public safety, for in so doing they are not only performing a public duty, but they are also working in their own interests. The passage of regulations safeguarding boarding and alighting passengers, the construction of safety zones and loading platforms, elimination of vehicle turns that interfere with pedestrian movement, prohibition of parking at places that make it dangerous for persons going from sidewalk to the car stops, are just a few of the things that can well be sponsored in an effort to popularize service and increase patronage.

If it can be shown, as it repeatedly has been, that the street railway can furnish faster, cheaper and above all safer service than the individual can provide for himself, the ranks of the car riders will be augmented and the coffers of the railway will gain accordingly.

### A Subway by Assessment Approved in New York

THE legality of the New York State act of 1909 permitting rapid transit lines in New York to be built through assessments on the property benefited bids fair to be determined soon. The line concerned is the proposed Sixth Avenue subway in Manhattan, construction of which is being strongly urged by the Manhattan borough president. Under his direction, the owners of a considerable part of the real estate immediately abutting on the route have agreed to pay an assessment of 10 per cent on their property to construct the new line. Sanction to the plan has now been given by the Transit Commission, though it points out that a 10 per cent assessment on all the property directly affected would yield only about half of the sum required. The commissions suggests, therefore, either an assessment increased to 20 per cent or to lay some part of the cost on property from half a block to a block on each side of the proposed route. It refers the choice between these methods to the municipal authorities.

Much can be said in favor of the plan of special assessments for rapid transit lines judiciously planned. But any act of this kind also contains an element of danger, which property owners in New York now will more generally recognize since Mayor Hylan can now appoint a board to construct rapid transit lines to be municipally owned and operated. Hence, as any property holder may object to his assessment, it is safe to say that active construction work on the new Sixth Avenue subway will wait until the courts act on some test case.

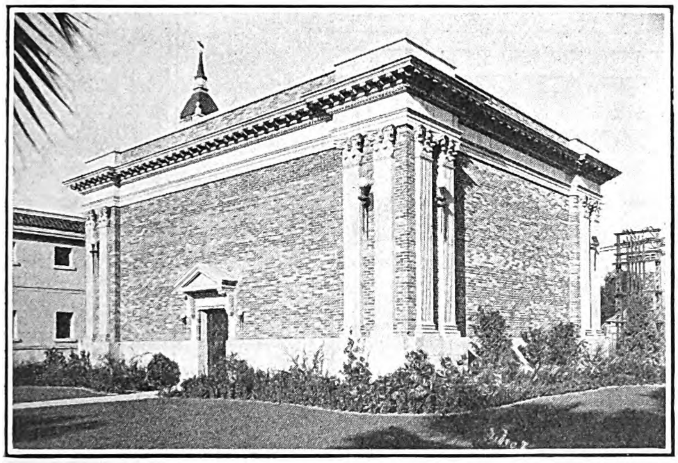
Wisely, the commission's order provides that the present Sixth Avenue elevated railway must remain in place until the new subway is ready to function. In view of the fact that the Sixth and Ninth Avenue lines together now carry over 150,000,000 passengers a year, of which probably at least half use stations exclusively on the Sixth Avenue branch, this was the only decision possible. No new north and south line on Manhattan is under construction, and the present lines certainly could not care for this number of passengers in addition to those now being carried.

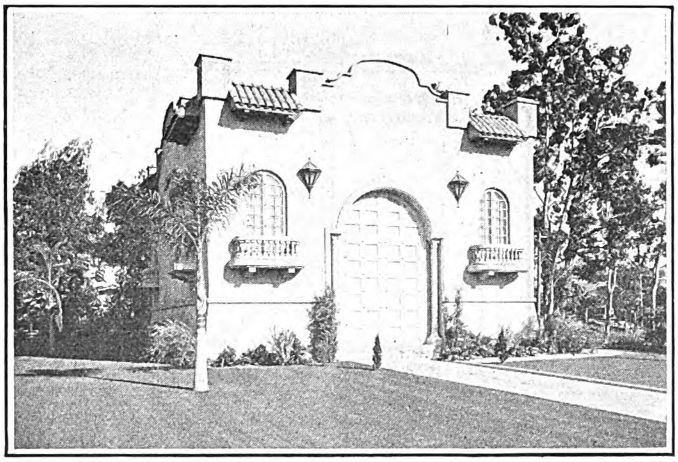
The removal of the Sixth Avenue elevated can be seriously considered only after the proposed Sixth Avenue subway has been built, and then only if the north and south traffic on Manhattan does not increase materially during the five years or more required to build and equip the subway. All past experience shows that traffic in New York increases more rapidly than the facilities. In fact, conditions are becoming so bad on trains and in stations during rush hours that the congestion suggests as a possible necessary early measure that those waiting to be carried form queues and be admitted onto the station platforms only as the trains have capacity to carry them.

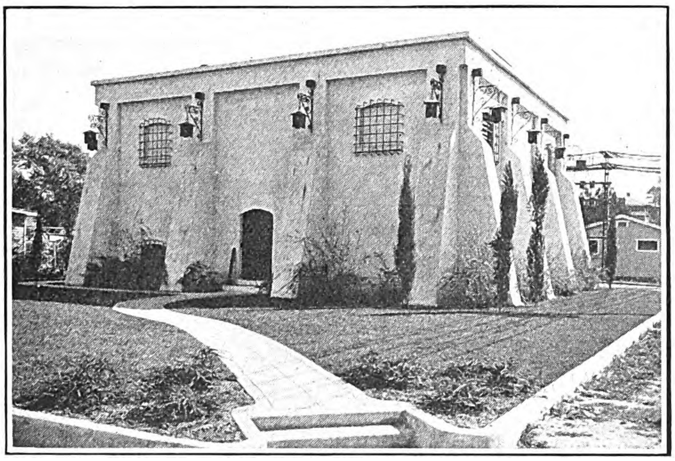
# Progress in Noiseless Substation Design

### The Los Angeles Railway Has Developed Substation Buildings to Harmonize with Surroundings in Residential Districts—Use of Automatics Has Produced Satisfactory Operating Results and Substantial Economies, Which Are Itemized

*By L. J. Turley*
Electrical Engineer Los Angeles Railway Corporation







These Designs of Noiseless Substations of the Los Angeles Railway Show the Architectural Treatment. Top, Left—West Adams. Top, Right—Melrose. Bottom—Garvanza

WITHIN the last three years the Los Angeles Railway has placed in service five automatic substations, four of these being 1,000-kw. single units, while the fifth is a double 1,000-kw. installation. A contract has just been closed for the sixth equipment, to consist of a 1,500-kw. automatic set.

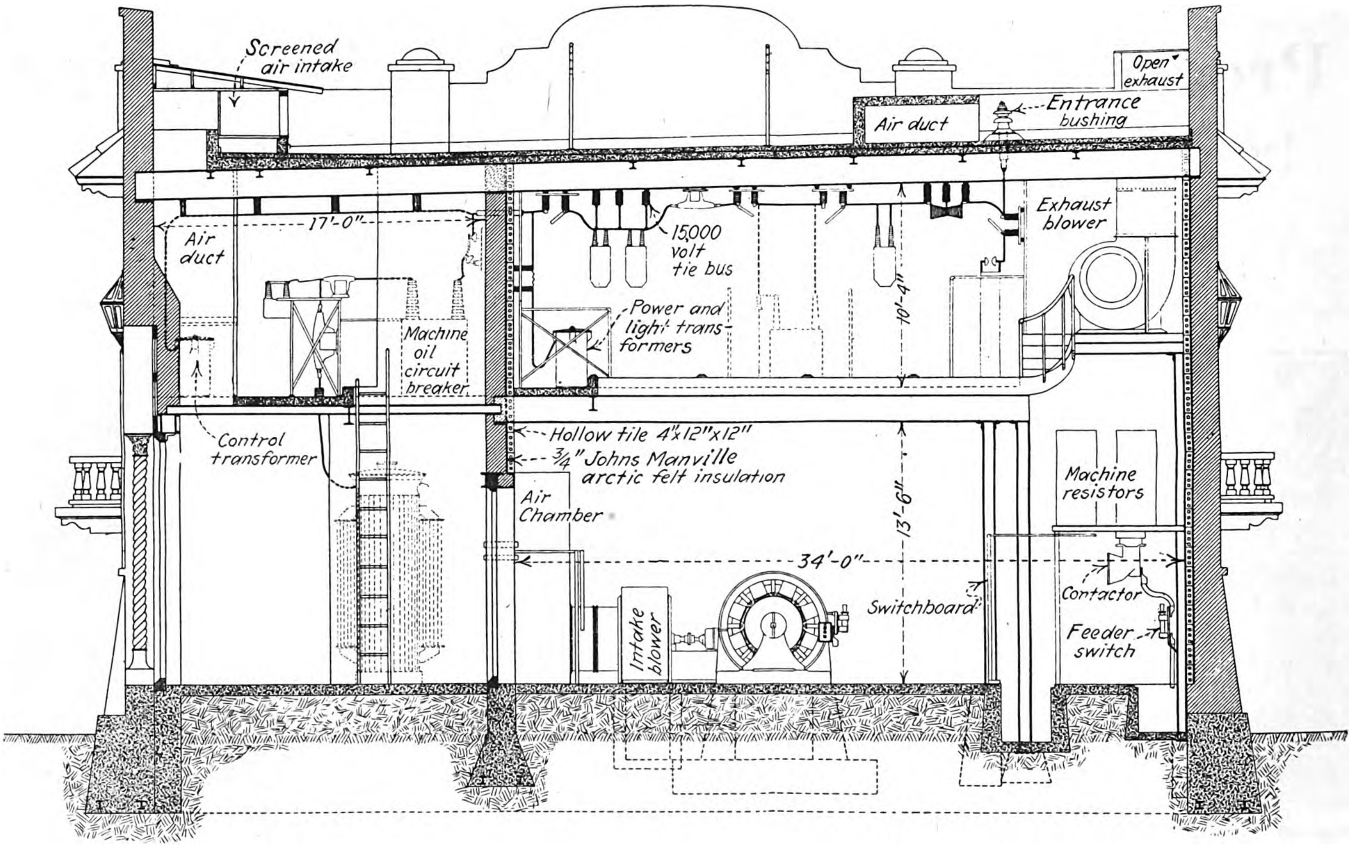
This is a good example of the gratifying trend toward the recognition of the economic possibilities claimed by the manufacturers for automatic control features, applied to one or two units in stations scattered over a spreading trolley system. This claim is now substantiated by the increased number of successful installations on other systems, where a desired reduction in cost of attendance has been obtained, together with a general improvement in power conditions.

The automatic type of substation has now passed the early development stage into economic use. A general degree of confidence seems to exist in its reliability for city and interurban service, and it is satisfactorily meeting every kind of normal or emergency load demand. Where high line switching formerly required the presence of an operator, the remotely controlled supervisory schemes of today have met this requirement.

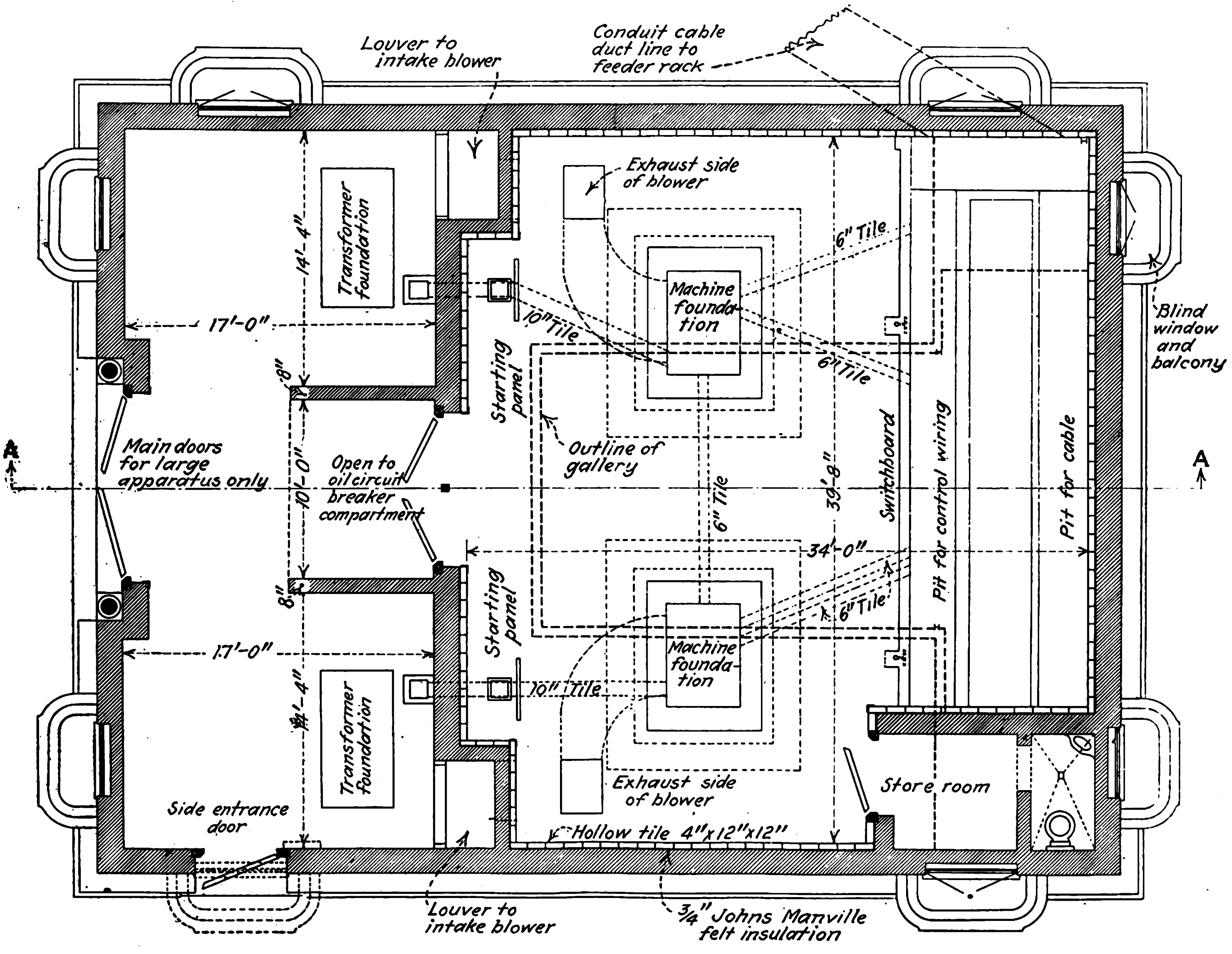
Ordinarily an increase of 6,000 kw. over a three-year period on any large city railway system is unworthy of comment, but due to the timely action of establishing five distinct power delivery points to the overtaxed generating and distributing system of the Los Angeles Railway, and to the favorable and satisfactory operation obtained from the very first installation, the writer considers it of sufficient importance to review briefly the situation that led up to the decision to institute a program involving the construction of noiseless automatic substations.

The redistribution program of 1920 called for several substations in the immediate outlying districts of the city. Without defeating the object of economically serving the entire feeding area, it became necessary to plan the station sites approximately near the established load centers. A problem arose on finding that some of them must be located in restricted residential sections. Realizing that former complaints had been lodged against other stations on account of noise and the unsightly appearance of the buildings, and with due regard for rights of property owners in residential sections, the railway company decided that future substations should be of fireproof structure, unusually attractive, beautifully parked, and with the added feature of eliminating the unnecessary noise which characterizes rotating machines and transformers.

There was a limited amount of available information on sound-proofing applied to substations, and the special conditions imposed novel considerations in combining soundproof construction, forced ventilation, and automatic control operation. Naturally this course would make property and building costs unusually high for 1,000-kw. single-unit installations, but it was considered


Screened air intake
Open exhaust
Entrance bushing
Air duct
17'-0"
Air duct
15,000 volt tie bus
Exhaust blower
Power and light transformers
Machine oil circuit breaker
10'-4"
Control transformer
Hollow tile 4"x12"x12"
3/4" Johns Manville arctic felt insulation
13'-6"
Machine resistors
Air Chamber
34'-0"
Contactor
Switchboard
Intake blower
Feeder switch

The Sectional Elevation of the Melrose Station Shows How Switches and Auxiliary Equipment Have Been Placed Overhead


Louver to intake blower
Conduit cable duct line to feeder rack
Exhaust side of blower
6" Tile
Transformer foundation
14'-4"
Machine foundation
Blind window and balcony
17'-0"
10" Tile
6" Tile
8"
Starting panel
Main doors for large apparatus only
Outline of gallery
Switchboard
Pit for control wiring
Pit for cable
A
A
Open to oil circuit breaker compartment
10'-0"
6" Tile
39'-8"
34'-0"
8"
6" Tile
Starting panel
17'-0"
14'-4"
10" Tile
Machine foundation
Transformer foundation
Exhaust side of blower
Store room
Side entrance door
Hollow tile 4"x12"x12"
Louver to intake blower
3/4" Johns Manville felt insulation

Floor Plan of the Melrose Station, Which Has Two Units and Separate Air Supply for Each Machine

TABLE I—BUILDING DIMENSIONS AND COSTS

| | Kw. Capacity | Building Dimension | Square Feet of Building Area | Cubic Feet Machine Room | Air Changes Cubic Feet per Minute | Real Estate | Building and Foundations** | Complete with Equipment |
|---|---|---|---|---|---|---|---|---|
| Garvanza | 1,000 | 43 x44′ | 1,892 | 26,000 | 9,000 | $953 | $17,915 | $74,806 |
| Melrose | 2,000 | 39 x52 | 2,128 | 33,000 | 30,000 | 7,398 | 26,280 | 109,056 |
| West Adams | 1,000 | 35′x44′ | 1,540 | 20,000 | 15,000 | 5,019 | 25,150 | 74,140 |
| West 54th | 1,000 | 35 x41′ | 1,435 | 21,000 | 15,000 | * | 21,230 | 68,255 |
| Central Ave | 3,000 | 45 x54′ | 2,430 | 36,000 | 40,000 | * | Under construction. | |

* On division carhouse property.
** Cost include parking, lighting, cable duct lines.

an asset in public good will, together with the improvements sought in giving better service with a shorter feeding area.

Regardless of the company's good intentions, two districts filed petitions of protest to the City Council, with emphatic objections to granting the railway's application, basing their claim on the ground that the architectural harmony of the district would be marred and property values decreased, noise or no noise. The railway realized the importance of rendering increased car service to the entire district, even in view of the protestants declaring the existing service satisfactory. After a year's delay the city granted the application, having been satisfied with the company's first attempt with the Garvanza substation. The ELECTRIC RAILWAY JOURNAL of July 8, 1922, contains a description of this station. Due to the improvements in arrangements and soundproofing in subsequent substations, it is considered of sufficient importance to present an abstract description of the building construction, together with views and plans, showing the accomplishment.

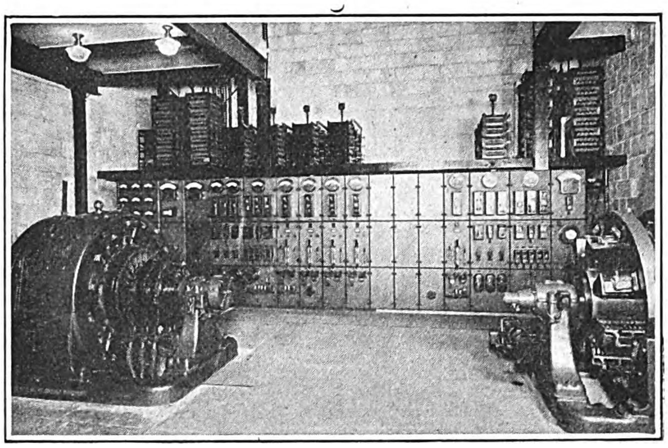
Each automatic substation is located in a district corresponding to its name: Vernon, Garvanza, Melrose, West Adams, West Fifty-fourth Street, and the proposed Central Avenue station. These are all indicated on the accompanying map, along with the manual substations. All are of soundproof design, except the one in Vernon industrial district. The following description is confined to those of noiseless design.

Incidentally, the addition of these substations did not permit any reduction in copper feeder cable, but actually required considerably more. This demonstrates the low voltage existing on the extended lines and the great dependency being placed upon the additional power delivery. Table I gives the general inside dimensions and costs. In addition to the original design of the building, all arrangements of apparatus and installation were made by the engineering department of the Los Angeles Railway.

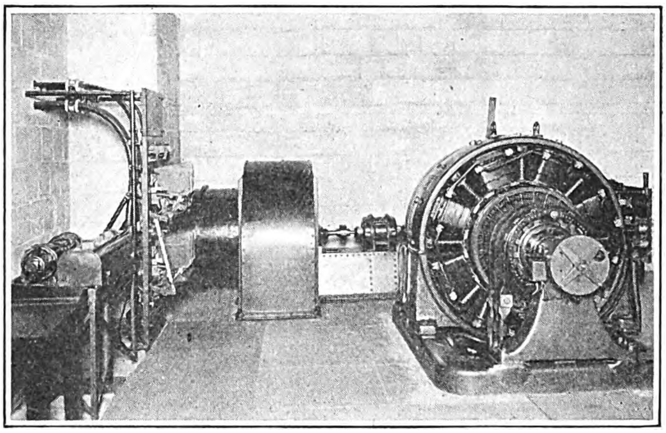
All substations have fireproof compartments for oil switches and transformers. There are no basements except a 2-ft. x 3-ft. pit located back of the switchboard, which is used for incoming underground feeder cables to facilitate the control wire connections at the base of the panels. As may be observed from the elevation of Melrose substation, a gallery is mounted over the machines for the indoor lightning arresters and 15,000-volt bus and switches. This plan is used with the two-unit, or high line installations.

TABLE II—OPERATING CHARGES

| | Monthly Average per Substation | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Repairs to Equipment | | Labor of Operators | | Supplies | | Total | |
| Year | Automatic | Manual | Automatic | Manual | Automatic | Manual | Automatic | Manual |
| 1922 | $9.94 | $131.13 | $83.16 | $564.44 | $16.07 | $20.75 | $109.17 | $716.32 |
| 1923 | 1.73 | 90.01 | 78.17 | 563.47 | 4.91 | 23.30 | 84.81 | 676.78 |
| | Monthly Average per 1,000 Kw. Capacity | | | | | | | |
| 1922 | $9.94 | $52.77 | $83.16 | $227.14 | $16.07 | $8.35 | $109.17 | $288.26 |
| 1923 | 1.73 | 36.22 | 78.17 | 226.75 | 4.91 | 9.37 | 84.81 | 272.34 |

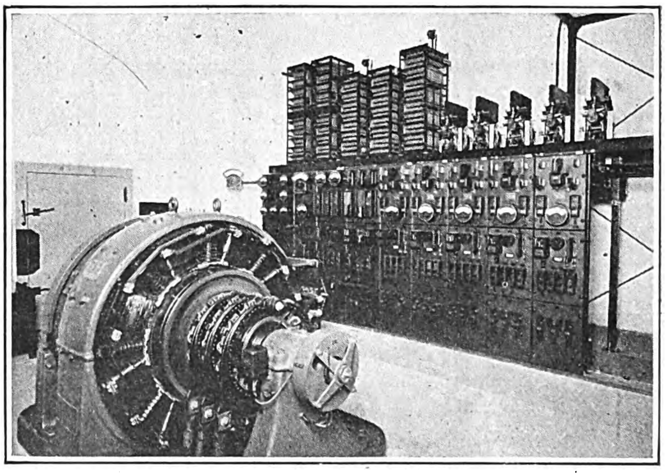


The Machine Room of the Two-Unit Melrose Substation. The Air Outlets Are Above the Grid Resistors

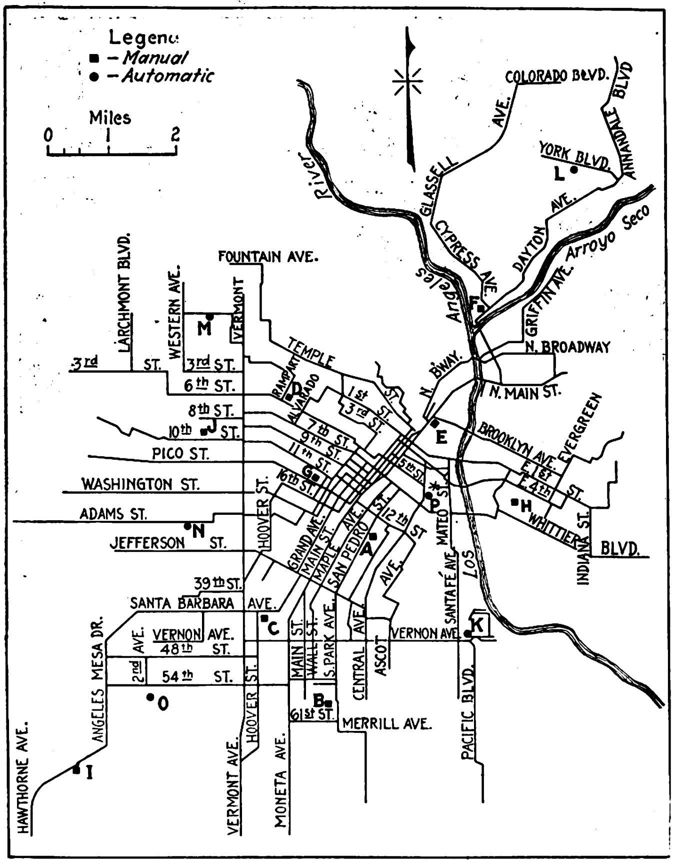


Intake Blower of the Melrose Substation

The hydro-electric system of the Southern California Edison Company supplies all the 15,000-volt power used by the Los Angeles Railway. The high-tension lines interconnecting with substations are owned by the railway company, and are three phase 50 cycle, 15 kv. to

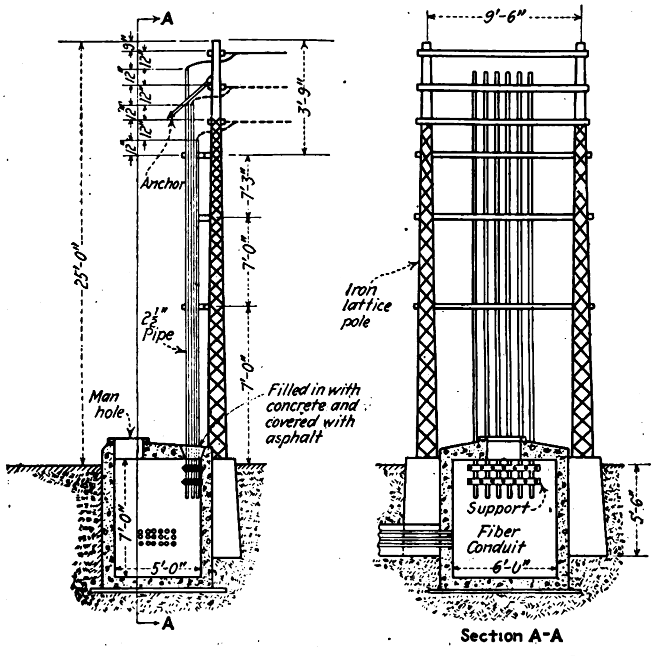


The Entrance to the Machine Room of the West Fifty-fourth Street Station Is Through a Refrigerator-Type Double Door


Legend
■ – Manual
● – Automatic
Miles
0 1 2
COLORADO BLVD.
ANNANDALE BLVD.
YORK BLVD.
L
GLASSELL AVE.
River
CYPRESS AVE.
DAYTON AVE.
Arroyo Seco
Angeles
F
GRIFFIN AVE.
FOUNTAIN AVE.
LARCHMONT BLVD.
WESTERN AVE.
VERMONT
M
TEMPLE
N. BROADWAY
3rd ST.
3rd ST.
6th ST.
8th ST.
10th J ST.
D
1st
3rd ST.
N. B'WAY.
N. MAIN ST.
BROOKLYN AVE.
EVERGREEN
E
PICO ST.
WASHINGTON ST.
ADAMS ST.
N
JEFFERSON ST.
G
H
P
A
WHITTIER BLVD.
INDIANA ST.
HOOVER ST.
GRAND AVE.
MAIN ST.
MAPLE AVE.
SAN PEDRO
SANTA FE AVE.
MATEO ST.
LOS
39th ST.
SANTA BARBARA AVE.
C
VERNON AVE.
48th ST.
54th ST.
ANGELES MESA DR.
2nd AVE.
O
B
61st ST.
MERRILL AVE.
MAIN ST.
WALL ST.
S. PARK AVE.
CENTRAL AVE.
ASCOT
VERNON AVE.
K
PACIFIC BLVD.
HAWTHORNE AVE.
I
VERMONT AVE.
HOOVER ST.
MONETA AVE.

The Locations of Both Manual and Automatic Substations Are Shown in the Route Map of the Los Angeles Railway

| Symbol | Name | Number of Machines | Capacity |
|---|---|---|---|
| A | Sixteenth Street | 4 | 3,600 |
| B | Slauson | 3 | 1,600 |
| C | University | 4 | 4,200 |
| D | West Lake | 3 | 1,400 |
| E | Plaza | 5 | 6,000 |
| F | Huron | 3 | 1,600 |
| G | Sentous | 3 | 2,600 |
| H | Soto | 3 | 1,800 |
| I | Centinella | 3 | 650 |
| J | Ardmore | 2 | 1,600 |
| K | Vernon | 1 | 1,000 |
| L | Garvanza | 1 | 1,000 |
| M | Melrose | 2 | 2,000 |
| N | West Adams | 1 | 1,000 |
| O | West Fifty-fourth Street | 1 | 1,000 |
| P* | Central Avenue (proposed) | 2 | 3,000 |


A
9'-6"
3'-9"
Anchor
7'-3"
7'-0"
25'-0"
2½" Pipe
Iron lattice pole
7'-0"
Filled in with concrete and covered with asphalt
Man hole
7'-0"
5'-0"
A
Support
Fiber Conduit
6'-0"
5'-6"
Section A-A

Standard Feeder Rack and Manhole for Los Angeles Automatic Substations

TABLE III—DATA ON OPERATION AND FAILURES

| Year | Number of Substations | Substation Days | Average Daily Kw., Hours | Daily Hours Operator Present | Actual Time Station in Service | Average Daily Minutes Lost Due to: Regular Inspection | High D. C. Voltage | Men Working | Equipment Failures | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1922 | 3 | 425 | 10,200 | 3.20 | 93.1% | 39 | 15 | 22 | 4 | 80 |
| 1923 | 3 | 1,095 | 13,900 | 2.20 | 97.7% | 24 | 10 | 7 | 2 | 43 |

| | A. C. Interruption per Substation | Number of Equipment Failures: Garvanza | Melrose | W. Adams | Total | No. of Device Giving Trouble: Garvanza | Melrose | W. Adams |
|---|---|---|---|---|---|---|---|---|
| 1922 | 41 | 8 | 2 | 2 | 12 | 21.33<br>64.69 | .69 | 133 |
| 1923 | 79 | 1 | 6 | 7 | 14 | 7 | 7.28.66 | 7 |

16 kv., aerially constructed with single line to each automatic station for the present. Provision is made at two substations for double high line entry when necessity warrants. Indoor oxide film lightning arresters and choke coils are installed at each station, except at two, which are of the outdoor type. The main-line 35,000-volt oil circuit breakers are automatically and electrically operated and controlled for undervoltage and overload, with sufficient disrupting capacity to care for short circuits.

### METHODS OF ELIMINATING NOISE

The soundproofing feature is used in the machine room only. The ordinary brick walls seem sufficient to prevent transmission of the transformer hum to the outside. Around the machine foundation is placed ½-in. elastite insulation, separating it from the substation 6-in. cement floor to deaden the vibration of the machine. Without any windows or steel frame work penetrating the walls or ceiling, the absorption of the noise developed within the building is obtained by use of the Johns-Manville ¾-in. Arctic insulation placed in layers between the ordinary hollow building tile facing and the 21-in. brick wall. The felt and tile are held securely fastened to the brick with large nails. The ceiling is made up of a 4-in. slab of reinforced concrete mixed with Truscon waterproof paste, on top of which is laid one layer of ¾-in. Arctic insulation, which is covered with an additional 3-in. slab of waterproof concrete.

With all doors 6 in. thick properly constructed with heavy beveled jambs, felt lined and held securely closed to a tight fit by Glockler refrigerator door clamps, the soundproof feature has been such a success that two of the substations were placed in operation and running for some days before any one in the neighborhood was aware of the fact, and then only from seeing the exterior lighting of the building at night and inquiring "when the noise was to start." Although one might detect a slight rumble when in close proximity to the outside wall, yet at 3 ft. distance no noise of machine, transformer or rushing air is noticeable against extraneous disturbances. As with the West Fifty-fourth Street station, a double door is used where entrance is planned from the outside direct into the machine room. Property values are advancing, and many new residences have been constructed since these stations were started.

The exterior view of Melrose shows blind windows with balconies. With a row of 10-watt lamps placed in a recess back of the amber colored glass, the lighting effect at night is similar to that with a drawn shade, as may be observed in the surrounding dwellings. This class of exterior design, with parking arrangements of shrubbery and automatic sprinkling system for lawn, as shown by the views, may not be necessary in every case. This is true of the West Fifty-fourth Street station, but still the principle of sound absorption used in this type of construction will be found satisfactory where such an installation is considered.

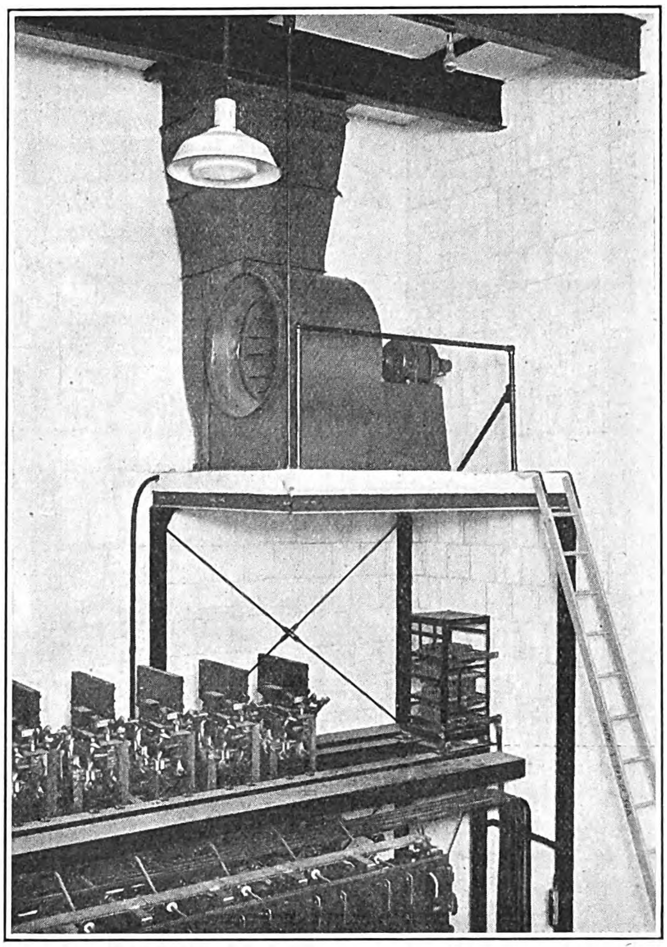
The Central Avenue station will have the added feature of an air washer scheme. This was felt to be necessary, since several failures due to poor contacts of relays have been attributed to dust accumulation, where automatic substations are located in a dusty district. The floors of all the transformer and oil switch compartments are provided with drainage to an outlet for oil in case of explosion or fire. A suitable number of fire extinguishers are conveniently located throughout the building.

### FORCED VENTILATION IS USED

The ventilating scheme for Melrose, as for the other forced-draft stations, is as follows: The air is drawn into the transformer room from the roof by way of a large duct, with 20 to 30 sq.ft. area. This duct is covered on the roof by a housing screened on the sides to prevent rain and large particles from entering. An attempt is made to filter the air in its passage by use of a removable tray covered with large mesh screen on which is laid one layer of cheese cloth. The air is drawn into the transformer room past all sides of the three-phase transformer, thence through a large fireproof louver, and forced into the machine pit by a Sturtevant No. 90 silent vane fan, directly connected to a 3-hp., 40-deg., 600-r.p.m. motor. The air in the machine and switchboard room is drawn up by a similar blower located near the ceiling, thence to the roof through an air duct, which extends out on the same plane with the roof, doubling back on itself. This exhaust duct is constructed along acoustic principles by baffling the noise of the machine and rushing air, yet not unnecessarily increasing the static pressure.

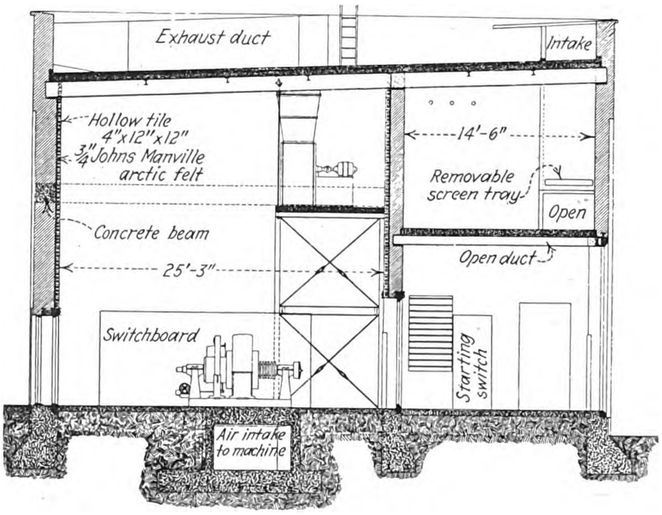
The grid resistors used in the station for machine and feeder control are located directly under the exhaust fan, so that hot air rises quickly in case the grids are connected into the circuit. Melrose has about 33,000 cu.ft. in the machine room, and being a double unit the air is changed in this station, with both units in service, approximately every minute. The 2-min. rate of change is about correct for the southern California climate to maintain proper transformer and machine room temperature for the 1,000-kw. installation on a 65 per cent load factor. Unless precautions are taken in locating the feeder resistors, it becomes necessary, as with the West Adams station, to provide an auxiliary exhaust blower of about 8,000 cu.ft. to care for the hot air, and to permit cooling of the feeder grids in the shortest possible time consistent with load conditions.

The blower motors are started up and operated with the machine. Provision is made for them to cut out 10 to 15 min. after the machine is shut down. They are equipped with an underspeed relay, which will shut down the machine in case either of the motors fails to come up to speed, or blows the main line fuses. These motors are fed from a three-phase bank of separately connected transformers. A throw-over switch in the motor circuit permits operation of the converter, independent of the blower motors.

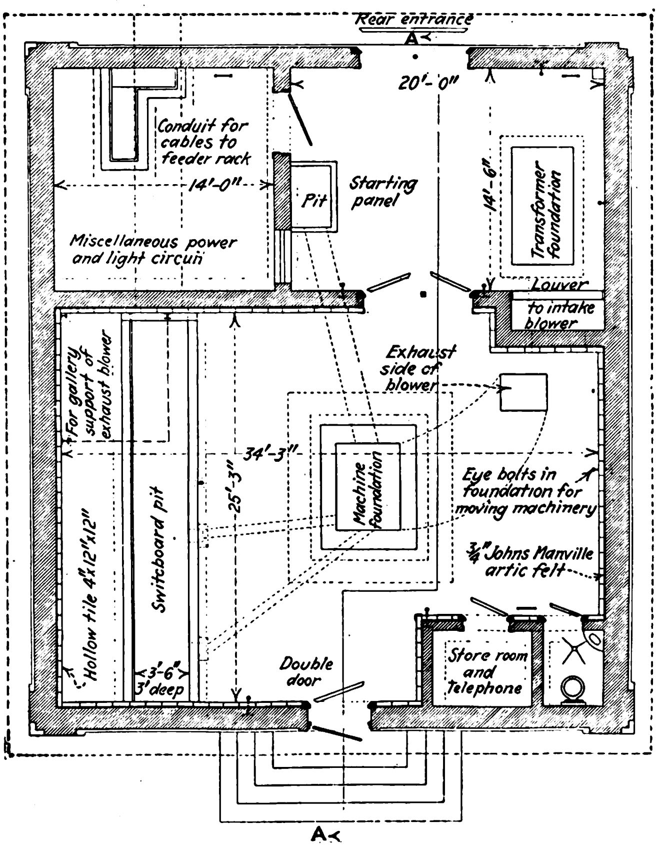


In the Fifty-fourth Street Substation the Exhaust Blower Is Mounted Above the Switchboard

Up to date each of the soundproof substations is equipped with General Electric apparatus. This gives greater interchangeability of parts. The 1,000-kw. synchronous converter has a 200 per cent overload rating for 2 hr. It is flat-compounded, with high reluctance interpoles and without flash barriers on either end. The transformer is three-phase, oil-cooled, with four 2½ per cent taps on the high-tension winding below 16,500 volts. The 1,500-kw. unit on order for Central



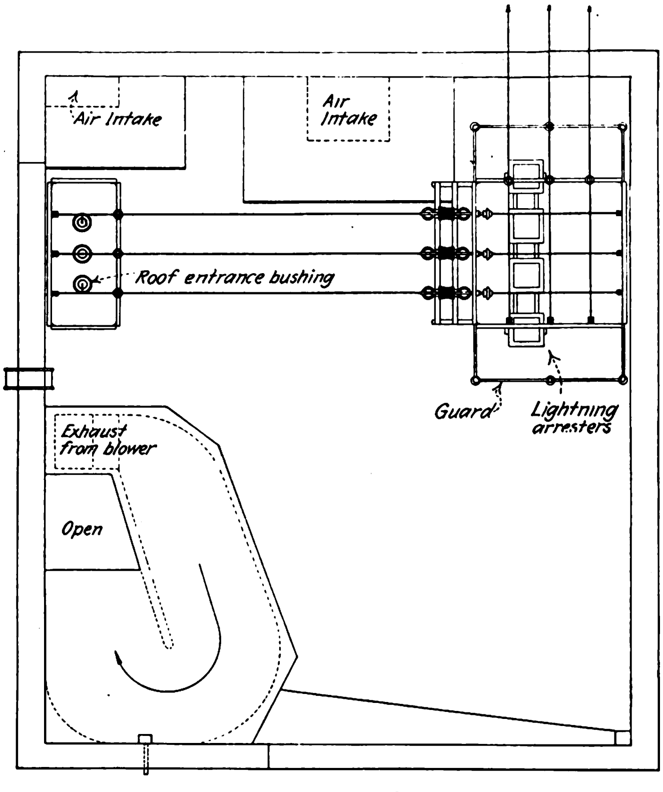
Vertical Section A-A of Fifty-fourth Street Station, Showing Air Intake and Exhaust


Rear entrance
A
20'-0"
Conduit for cables to feeder rack
14'-0"
Pit
Starting panel
14'-6"
Transformer foundation
Miscellaneous power and light circuit
Louver to intake blower
For gallery support of exhaust blower
Exhaust side of blower
34'-3"
25'-3"
Machine foundation
Eye bolts in foundation for moving machinery
¼" Johns Manville artic felt
Hollow tile 4"x12"x12"
Switchboard pit
3'-6"
3' deep
Double door
Store room and telephone
A

**The Floor Plan of the West Fifty-fourth Street Substation Shows Arrangement for a Single Unit**

Avenue station will have flash barriers on the d.c. end only.

All substations have current-limiting resistors for the machine current, while for the positive feeders resistor control is used in three stations, with the high-speed circuit-breaker type for the latest two constructed. There are usually four positive 600-volt feeders in each substation, with provision for an ultimate capacity of eight. This number is due to the extensive trolley sectionalizing policy of this company.


Air Intake
Air Intake
Roof entrance bushing
Guard
Lightning arresters
Exhaust from blower
Open

**Roof Plan of Fifty-fourth Street Station. Note the Circuitous Route for the Exhaust Air**

All feeder cables leave the switchboard through a pit to underground fiber conduits, which extend from the inside of the substation about 50 ft. to a feeder rack; thence aerially to the overhead trolleys. This is shown in one of the illustrations. The feeder rack was considered a better means to take care of the cables on leaving the building, since it permits the building to be unattached and adds to the outside appearance. There are but two stub-end feeders out of a total of 24, all the rest being tied in with manually operated substations. Each feeder has a d.c. electrolytic lightning arrester without choke coils. The insulated negative feeder scheme is used extensively with these stations for reducing rai potential gradients and minimizing the effects o electrolysis.

The control and protection for all machine and resistor-type feeders follow the standard General Electri methods. The feeder control bus is energized at a times, whether the machine is running or not. Hov ever, there are two special means of meeting cond tions. One multiple-end feeder is provided with a r verse-current relay, so that it will be disconnect from the station bus in case of reverse feeding. It automatically reclosed when the outside trolley volta is lower than the station bus, so that this feeder usually disconnected from the station during the per when the machine is off the line.

The West Fifty-fourth Street d.c. reclosing fee are equipped with high-speed circuit breakers. Th are provided with the standard General Electric a ilary feeling out control with the added feature with the manually-operated stations in hand grounded trolley wires. At the instant of a grou trolley wire, the high-speed breaker opens the cir The auxiliary feeling out detects whether the exist of the grounded wire warrants keeping the feeder o At the end of a 10-sec. period, if the feeder is cle of ground, normal service is resumed, but if at the of 10 sec. the ground still exists, then the feeling is delayed a predetermined time, usually 10 min., be an attempt is made to detect outside conditions. process is repeated in the same sequence until nor conditions are established. A considerable amount trolley wire has been saved from being annealed. Th also is the important consideration of the safety traffic, and trainmen are enabled to clear the wire f ground without fear of hazard.

### TIME SWITCHES CONTROL HOURS OF SERVICE

The machine is controlled by a time switch set about 18½ hr. per day, including Sunday. This sv gives a definite starting and stopping period, an addition prevents starting up of the machine due t voltage during the early morning period. Another switch controls the exterior lights from sundo midnight. No scheme is included for remote i ic telling when the machine is on or off, or any meth remote supervisory control. Some improve ent i matter is contemplated shortly. To pro de mea determining the nature of any abno nal condi there is being considered for each au omatic subs a graphic strip chart meter, showin the total m ampere load and bus voltage, toge ner with two seat 33¾ in., leaving an aisle of 21½ in. This width of aisle allows free passage of passengers in both directions because of the low backs which do not extend the full width of the seats. The seat construction is the same as is usually found in rapid transit cars, with full spring cushion and back and a handle located at the aisle end of each back.

In the other car the backs of the stationary seats, covered also with Pantasote, have been spaced 61 in. apart, allowing 21 in. of knee room between facing seats. This arrangement of seats gives a capacity of 108, or an increase of 44 per cent over the former seating arrangement.

The three-passenger seats have not been placed at the extreme ends of the cars. The last two seats are of the two-passenger type, allowing a wider aisle at the body entrance. No change has been made in the platform or vestibule doors. One toilet has been removed from each car, allowing space for seats for four more passengers.

## St. Paul Valuation Before Minnesota Commission

### Cost to Reproduce the Property Is Submitted by Consulting Engineer for the Company on Six Different Bases of Unit Costs—Going Concern Value Placed at $4,000,000

The Railroad and Warehouse Commission of Minnesota opened hearings on March 31, 1924, to determine the value of the property of the St. Paul City Railway. Upon the valuation fixed by the commission at this hearing will depend the rate of fare to be in effect in St. Paul. The company now has a 6-cent fare, which is lower than that established in many cities of the size of St. Paul, but the city is endeavoring to reduce this rate. The present case was started in 1921 and after a conference of the valuation engineers for the company and the cities of Minneapolis and St. Paul with the commission it was decided to make valuations of the property on six bases.

At the March 31 hearing, Mr. Drum of A. L. Drum & Company, Chicago, on behalf of the company, submitted to the commission valuations of the property on these six bases, which are itemized by classes of property in the accompanying table.

The St. Paul City Railway operates the entire street railway system located within the corporate limits of the city of St. Paul, Minn., and a line to South St. Paul, consisting of about 8.29 miles of single track outside of the city limits. The inventory and appraisal includes the entire property in the present St. Paul 6-cent fare zone, consisting of the property of the St. Paul City Railway and the property comprising the line on East Seventh Street from Duluth Avenue to city limits of St. Paul and the South St. Paul line extending outside of the city limits of St. Paul. The property consists principally of 176.71 miles of single track; lands; the power distribution system, consisting of overhead trolley, feeder lines, underground conduit and underground wires; car equipment; carhouses; office, shops and miscellaneous buildings; four rotary converter substations, having an aggregate capacity of 20,400 kw., all primary power being furnished by the Minneapolis Street Railway and the St. Anthony Falls Water Power Company; shop machinery; tools; miscellaneous equipment, consisting of office furniture and fixtures.

The valuation of the physical property was made from a complete and detailed field inventory of the property taken as of Jan. 1, 1920, to which have been added the net capital expenditures from then to Jan. 1, 1922, to bring the valuation to the latter date.

The cost to reproduce the physical property now represents the minimum amount of capital that would have been required actually to reproduce the physical property of the company as of Jan. 1, 1922, on the following six different bases of unit costs: (1) Pre-war cost as of Jan. 1, 1920, using average prices for the five-year pre-war period, 1911 to 1915, inclusive; (2) ten-year average cost as of Jan. 1, 1920, using average prices for the ten-year period, 1912 to 1921, inclusive; (3) July 1, 1921, cost as of Jan. 1, 1920, using current prices as of July 1, 1921; (4) present-day cost as of Jan. 1, 1920, using current prices as of April, 1922; (5) Sept. 15, 1923, cost as of Jan. 1, 1920, using current prices as of Sept. 15, 1923; (6) estimated original cost as of Jan. 1, 1920, derived from the books of the company, or estimated, using prices in effect when property was installed or purchased.

The total power supply used by the St. Paul City Railway Company is generated at the steam power station of the Minneapolis Street Railway and at two water power stations operated under a lease from the St. Anthony Falls Water Power Company to the Minneapolis Street Railway, expiring June 1, 1937.

The value of the water power leases to the St. Paul City Railway is based on the saving effected due to the two water power leases, this saving being computed on the basis of the total cost of the electric power pur-

THE COST TO REPRODUCE NEW AND THE ESTIMATED ORIGINAL COST OF THE PHYSICAL PROPERTY OF THE ST. PAUL CITY RAILWAY AND LEASED LINES AS OF JAN. 1, 1922

| Division | Pre-War Cost, Average Prices 1911-1915 | Ten-Year Average Cost, Average Prices 1912-1921 | 1921 Cost, Prices Current July 1, 1921 | Present-Day Cost, Prices Current April, 1922 | Estimated Original Cost | September, 1923, Cost |
|---|---|---|---|---|---|---|
| Land | $994,613 | $994,613 | $994,613 | $994,613 | $994,613 | $994,613 |
| Track and paving | 5,482,794 | 7,184,175 | 9,856,108 | 8,960,410 | 4,475,782 | 9,033,012 |
| Bridges, trestles and culverts | 114,445 | 129,284 | 141,976 | 138,104 | 109,633 | 141,841 |
| Tunnels | 400,062 | 522,167 | 657,574 | 651,138 | 329,679 | 640,733 |
| Electrical distribution system | 1,179,120 | 1,654,123 | 1,742,350 | 1,585,408 | 1,256,550 | 1,888,921 |
| Rolling stock | 2,818,151 | 4,390,329 | 5,838,799 | 5,257,859 | 2,599,280 | 5,932,093 |
| Substation equipment | 395,453 | 527,164 | 720,114 | 639,908 | 456,916 | 720,322 |
| Shop machinery and shop tools | 561,742 | 782,811 | 954,754 | 807,375 | 564,872 | 989,141 |
| Buildings and structures | 988,416 | 1,401,241 | 1,731,750 | 1,612,750 | 974,082 | 1,717,196 |
| Furniture and fixtures | 68,530 | 104,588 | 140,645 | 122,622 | 68,530 | 148,638 |
| Stores, tools and miscellaneous equipment | 578,027 | 578,027 | 578,027 | 578,027 | 577,795 | 578,027 |
| Expenditures not apparent in inventory | 149,696 | 149,696 | 149,695 | 149,695 | 89,996 | 149,696 |
| Engineering and superintendence | 686,552 | 920,910 | 1,175,320 | 1,074,896 | 624,887 | 1,146,712 |
| Administration, organization and legal expense | 671,354 | 747,138 | 831,457 | 817,534 | 661,628 | 822,100 |
| Taxes during construction | 220,485 | 312,002 | 442,835 | 442,835 | 220,485 | 422,143 |
| Interest during construction | 1,837,133 | 2,447,793 | 3,114,720 | 2,859,980 | 1,680,567 | 3,041,422 |
| Working capital | 305,444 | 305,444 | 305,444 | 305,444 | 305,444 | 305,444 |
| Cost of financing | 872,600 | 1,157,575 | 1,468,809 | 1,349,929 | 799,536 | 1,434,602 |
| Grand total | $18,324,617 | $24,309,080 | $30,844,990 | $28,348,527 | $16,790,275 | $30,126,656 |

chased under the water power leases and the total cost of manufacture of this if generated at a modern steam power station. The total saving to June 1, 1937, is prorated between the Minneapolis Street Railway, the St. Paul City Railway and the Minneapolis & St. Paul Suburban Railroad on the basis of the total kilowatt-hours used by each. This element of value was included at $782,229.

The presentation of the claim for "going concern value" was made generally on the basis that the St. Paul City Railway had passed through the following stages of development: (1) Construction period; (2) developmental period of construction; (3) period of development into a successful going concern.

Mr. Drum submitted that the fair going concern value of the property was determined to be not less than $4,000,000, based on an estimate of the cost of placing the physical property in successful operation.

The basis recited that, in addition to the cost of the component parts of the bare physical property, the cost of placing the physical property in successful operation, that is, the cost of converting the inert railway plant into a successful operating system, is an element of cost that is encountered in creating a street railway system. In determining the amount of this item of cost the fact was considered that the St. Paul City Railway is in active and successful operation and has passed through the period between the beginning of operation and the time when the business earns not only operating expenses and taxes, but also a return on the investment, so that the cost of bringing the bare physical property into an efficient operating going concern has been encountered and met.

The business of the company has been built up, the service and equipment have been planned and perfected successfully to serve the business, an experienced and successful operating staff has been organized, trained and perfected in its duties, and extensions have been made into unpopulated territory requiring many years of operation before the increase in population (due to the construction of such extensions) can create traffic sufficient to pay the operating expenses and interest on the capital invested in such extensions.

Another element of going concern value submitted was that due to the consolidated operation with the Minneapolis street railway system, which was measured by capitalizing the estimated saving per year to the St. Paul company.

# The Readers' Forum

## *Scheduling Car Leaving Times*

PIQUA, OHIO, March 31, 1924.

To the Editors:

Your editorial entitled "Make Your Headways Sell Your Service" in the issue of March 15 has in it so much with which I find myself in thorough agreement that I hesitate to take exception to some other features of it. Let me rather suggest that we expand the ideas of scheduled leaving times and of so-called "freak headways" a little further.

While I agree that freak headways should not be deliberately set up when they reasonably can be avoided, there are some circumstances and conditions that have a very marked bearing on this question. Likewise in the matter of scheduled leaving times of cars on lines operating on a "regular" headway.

Take, for example, three lines each operating on a 10-minute headway from a central terminal using common track for 1½ or 2 miles out to the point of divergence. I believe that as a general rule, if cars on routes A, B and C are spaced 3, 3 and 4 minutes apart over each 10-minute period on the common track much better service is provided than if three cars, bunched, went out over this 1½ or 2 miles every 10 minutes. The advantage of frequent service in the short-haul territory outweighs the possible disadvantage to the patrons of lines B and C whose cars leave the central terminal at 3, 13, 23, etc., and 6, 16, 26, etc., minutes after the hour rather than at 10, 20, 30, etc., minutes after the hour.

On a relatively small system with several lines radiating from a central point and with very little joint track used by cars on different routes, it generally would be desirable for all cars to leave at the same 10, 20 or 30 minutes past the hour, both for ease in remembering the schedule and to facilitate transfers. But peculiar local conditions might modify any general rule.

Take again the case of suburban and interurban service operated from a terminal station like that of the Pacific Electric Railway in Los Angeles on headways of 20, 30 or 60 minutes, with three, four or five-car trains. Concentration of scheduled leaving times serves to limit the station capacity not only as to tracks but also as to waiting room area, gate, passageway and platform space. Much better service is possible by spreading the leaving times of different lines more evenly over the hour. It also would have a tendency to smooth off the power peaks.

The staggered hour plan is applicable not only to the hours for industrial and other labor for the purpose of smoothing off the traffic peaks, but may be applied to scheduling of cars and trains from concentrated terminals.

Referring now to the freak headways there seem to by two features you have raised for consideration: First, headways in excess of 5 minutes or in excess of 10 minutes, which are not exact multiples of 5 minutes, such as 17 minutes or 28 minutes; second, headways that are unbalanced such as 4 and 6, or 3 and 7, even though the average may be exactly 5 minutes.

I would say that the occasion would be very rare that would justify a 28-minute headway rather than a 30-minute headway, particularly if we were dealing with an individual line not complicated with local service. Very often suburban service is supplied by having certain cars (i.e., every second, third, fourth, fifth or sixth car) in city service run through to the suburban terminal. The traffic demand on the city line determines the basic headway for the city service. The suburban service, particularly in off-peak hours, is not determined by traffic which may be very light, but, let us say, has been determined upon as a matter of policy to be on a headway of approximately 15 minutes.

If the city service is on an 8-minute or 7-minute headway, we could probably stretch a point and use a basic 7½-minute city headway and send alternate cars to the suburban terminal on an even 15-minute headway. But if the city line traffic requires a 6-minute headway shall we take alternate cars and give a 12-minute suburban headway, or take every third car and give an 18-minute headway? I know of conditions that would justify the 12 and others that would justify the 18.

If a 6-minute headway is proper for the city line it would be too much like making the tail wag the dog to say that the city line should be cut to 5 minutes in order to make a nice even 15-minute headway to the suburban terminal. And likewise, if a 6-minute headway is required, a 7½-minute headway would be very inadequate and quite unjustifiable merely to make an even 15-minute suburban headway.

Every third car on a 5-minute headway, or every fifth car on a 3-minute, make up an even 15-minute suburban headway, but if city traffic requires a 3½ or 4-minute headway, the resultant suburban headway would be 14 minutes in the first case and either 12 or 16 minutes in the second case. Conditions may justify arranging the headways in cycles of 4, 4, 4 and 3 minutes, every fourth car being a suburban car on an even 15-minute headway. And let me say that I would put the suburban car, which serves the longest stretch of the line, following the 3-minute headway in the 4, 4, 4 and 3 cycle.

The foregoing discussion assumes double-track operation, at least no obstacles due to different headways on single track. But very often the problem is complicated by single track and again general rules must be altered to suit the local conditions.

Much of what has been said relative to suburban cars operated as integral parts of the city service is applicable to city lines with split or multiple terminals, turn-back service, etc. Typical examples may be found on the Milwaukee system and on the Winnipeg lines. Service demands on the main line should generally fix the main line headways rather than the desirability of making the branch line headways multiples of 5 minutes. I have before me a concrete example of the effect of changing a main-line headway from 6 to 5 minutes with resultant branch line headways changed from 12 to 10 minutes.

The change was made for the off-peak hours in the middle of the day and was not based upon traffic checks, which, by the way, showed a 6-minute headway to be adequate, but for some other reason, perhaps to make the branch line headways 10 instead of 12 minutes. The car mileage was increased about 750 car-miles per day with no appreciable increase in revenue. It simply showed that a 6-minute headway served the frequency factor of adequate service on that particular line as well as a 5-minute headway. I believe 750 car-miles per day is too great a price to pay for the difference between a 12- and a 10-minute branch-line headway.

Moreover, the electric railways in this country are operating on rather narrow margins and, speaking generally, are not in a position to waste service for the sake of headways of exactly 10, 15 or 20 minutes. One or two cars on one line for a few hours does not seem to cost much for one day, but the cost of one or two more cars on each line totals a neat little sum in the course of a year. In many cases the additional expense produces no commensurate return.

With reference to combination headways of 7 and 3 minutes I do not believe many schedule departments are laboring under any illusions on this point. While the 3 and 7 combination is rather extreme, a 5 and 7, a 4 and 6, a 3 and 5, a 2 and 3 or some other similar combination may be used, not by mistake or through carelessness, but for a very definite purpose.

The use of combination headways is particularly suited to city lines having turn-back or short-line service where all cars do not go to the end of the line, and where there is from 20 to 30 per cent of the total traffic beyond the turn-back point. If the traffic check taken within the zone of maximum loading shows the need for an average 5-minute headway the through cars would be overloaded and the turn-back cars would fail to carry their share of the load if all cars were spaced exactly 5 minutes apart.

A much better balance of the loads is obtained by the combination headway of 4 and 6 minutes with the short line car following the 6-minute interval and the long line car following the 4-minute interval. It is not advisable to put in too much differential, and in this connection it may be noted that a short-line passenger just missing a short-line car can take the next car which will be a through car. But a through passenger unable to get aboard an overloaded through car or just missing it cannot reach his destination on the next car (which is "turning short") but must wait for the next through car. Therefore the through cars should be favored in the time differential even more than the traffic ratio would indicate.

Another occasion for justifying combination headways is where single cars and two-car trains are used on the line at the same time. If traffic comes to the line at such a rate as to justify a 4-minute service with single cars, or an 8-minute service with two-car trains, the schedule for alternate single and double units should not be an even 6-minute headway. The double units would be underloaded and the single units would be overloaded.

Experience indicates that a space interval in front of a two-car train equal to twice the interval in front of a single unit produces an unbalance in the other direction, at least in city service subject to variations encountered in actual surface operation. In the case cited the combination headway would probably work out on a 5 and 7-minute basis rather than on a 4 and 8-minute basis or on a 6 and 6-minute basis.

Thus, in the tendency toward lack of balance in passenger loads due to difference in length of route or territory served or in the size of the successive passenger carrying units, we find ample justification for combination headways made up of unequal intervals.

I realize that in endeavoring to make some points clear I may have made some general statements open to the same criticism that might apply to the editorial. If so it only proves the point that each property has its own peculiar problems which require separate analysis and individual treatment. This leads me to quote the third paragraph of your editorial in pointing the way:

"Undoubtedly great economies in electric railway operation have been accomplished by the scientific scheduling of cars. Careful study by competent men is required to prepare time-tables so that cars will not pull out too early, stay out too long, waste time in excessive layovers, or bunch in the central district. The time and money employed to make accurate traffic checks are well spent." JOE R. ONG,

Consulting Transportation Engineer.

# Association News & Discussions

## Badgers View Utility Business Broadly

### Responsibilities of Utility Management, Speakers' Bureau Activity and Training of Women Employees for Publicity Work Are Considered—Railway Section Holds Lively Discussion on Many Operating Subjects

At THE meeting of the Wisconsin Public Utilities Association, held at the Hotel Pfister, Milwaukee, on April 17 and 18, a broad conception of the utility business was voiced by the speakers at the general sessions. In the railway sectional meeting, held during the afternoons of the two-day session, papers dealing with detailed technical operating and maintenance problems were given a spirited and enthusiastic discussion. Although the railway men in attendance did not quite accept the invitation of Chairman B. W. Arnold to remove their coats if necessary, the frank and free discussion accorded most of the papers added greatly to the value of these sessions.

The broadminded thinking of the general sessions reached its climax in an address delivered on Friday morning by John F. Gilchrist, vice-president Commonwealth Edison Company, Chicago, who took the responsibilities of utility management as his subject. He said that the management of the present-day public utility property is vested with responsibility to many interests, and unless each is fully considered in the administration of the company's affairs, the utility does not develop its service in the fullest sense of the term. The modern utility management carries a direct responsibilty to the people of the district served, to the customers of the utility, to the employees of the company, to commercial and industrial organizations in the community and to the stockholders of the company.

If the utility discharges its obligations to the first four interests in accordance with the fullest conception of real public service, Mr. Gilchrist contended, the interests of the stockholders will be automatically safeguarded. This, he said, is true because failure to earn a fair return to the stockholders immediately reacts to curtail the service which the company can render because such failure limits the ability to meet the needs of a growing community.

Mr. Gilchrist went further in his analysis and said that each management owes an obligation to its brothers in the industry and should take part fully in any activity to further the interests of the industry as a whole.

Since the utility industry can only function properly and efficiently as a monopoly, Mr. Gilchrist said that this in itself imposed several extremely important obligations and responsibilities. The first of these is the responsibility to maintain both continuity and adequacy of service. Then there is the responsibility of providing new capital to take care of needed extensions as the community develops. Customer ownership of the company's securities has proved to be one means of meeting this later requirement.

A further responsibility is that of assuming a proper place as a leader in the community. Another is the development of young men as future utility leaders and managers. The rapid development of industry in general and the increasing complexity of the problems involved raise a serious question, Mr. Gilchrist said, of the possibility of developing men rapidly enough to keep pace with the continually increasing requirements.

### SATISFACTORY PROGRESS MADE

In his opening address at the general session, President Harold L. Geisse attributed the success of the association to the co-operation of its individual members and also paid a tribute to the assistance rendered by the associate manufacturer members. The activities of the association and its committee on public utility information has produced a noteworthy improvement in public understanding of the utility problems in Wisconsin and surrounding territory. He reported the organization of a speakers' bureau to supplement with the spoken word the work carried on by the committee on public utility information through the newspapers.

### WOMEN EMPLOYEES TO HELP

Another step in the publicity work of the association was marked, Mr. Geisse said, by the organization of a women's public information committee in conformity with the work started by the National Electric Light Association. In their various capacities, he said, women are important contact points with the public and their education and training may be expected to aid materially in presenting authoritative facts to the general public regarding the utility business.

Miss E. M. Westenhaven, chairman of the women's public information committee, outlined the progress already made in organizing this women's work. Of the 575 women employed in utility work, exclusive of telephone companies, in Wisconsin, 528 have been included in the educational work under way. Speaking of the qualifications of women employees, she cited the success with which they have engaged in the sale of utility securities to the public as an illustration of their qualifications for assisting.

W. S. Vivian, Middle West Utilities Company, delivered an address on the subject of "Service." He drew a distinction between service and facilities, pointing out that the latter includes the mechanical facilities of the company only, whereas the former also includes the personnel and the personal contact.

General principles which have governed the organization of safety campaigns in various cities were outlined by J. W. Harte, Elliott Service Company of New York.

### HIGH INTEREST IN RAILWAY SECTION MEETINGS

At the opening of the railway section meeting Thursday afternoon, Chairman B. W. Arnold, Chicago, North Shore & Milwaukee Railroad, voiced approval of the combined meetings with other branches of the utility business. He thanked the membership for its co-operation during the two-year period of his chairmanship and stated that the individual members profited from meetings of this kind in direct proportion to the enthusiasm and energy with which they entered the activities and participated in the discussions.

A paper on substitute ties was read by J. C. Jameson, vice-president Dayton Mechanical Tie Company. He said that their use, although now stimulated by the difficulty of securing good grade wood ties and by the constant upward trend of wood tie prices, would likely in a few years be forced upon railways by the government in its effort to conserve the forests. He advocated some means of preventing the transmission of the shock and vibration of rolling stock directly to the concrete in which the ties are imbedded. Concrete, as a track foundation in paved streets, was held by him to be the best construction. Crushed rock or gravel ballast is practical only in open track which permits of periodical tamping. When sealed over by street paving, some shifting of ballast must occur.

In the discussion of Mr. Jameson's paper, A. A. Oldfield, Oshkosh, stated that the high price of substitute ties prevented their wider use. He also said that it sometimes became necessary to use stone ballast when making repairs under track carrying traffic. In regard to noise he reported no more noise with substitute tie construction than is obtained on wood ties, when the traffic consists of light-weight cars.

Dudley Montgomery, Madison, said that his property had tried the use of steel ties and had found considerable difficulty in bringing the track to line and surface in hot weather. He also said that steel ties had been found more noisy than wood ties and believed that the type of pavement was a considerable factor in the selection of the type of tie to be used. He questioned the value of a substitute tie in monolithic construction where the track is imbedded in concrete. He felt that in this form of construction the rail is carried and imbedded in the concrete, and described the use of old wood ties in some recently constructed track in Madison, utilizing wire reinforcing between rails. He stated that this track was expected to give good results for the operation of light-weight cars.

C. E. Warwick stated that no particular difficulty had been encountered in Green Bay in properly lining up the track when using substitute ties. He said that in hot weather the practice of leaving some of the joints open and completing the welding operation at night or in the evening under lower temperatures enabled proper alignment to be made. Mr. Oldfield said that by using 60-ft. rail lengths in Oshkosh, it was possible to weld up approximately five lengths of rail in advance. By keeping the aligning gang at work directly ahead of the concrete machine, no particular difficulty had been experienced.

N. C. Rasmussen, Wausau, reported some difficulty in holding track to line and surface in hot weather but said that his property was able to obtain satisfactory results by avoiding welding too far in advance of the concreting gang.

### CHILLED IRON WHEELS DISCUSSED

The manufacture, test and maintenance of chilled iron wheels to meet service conditions was the subject of a paper read by Francis J. Fox, Griffin Wheel Company. Mr. Fox listed the essential requirements of a car wheel as follows: (1) Sufficient hardness of the wearing surface to carry concentrated loads without excessive deformation over irregular tracks at high speeds; (2) maximum service on the wearing surface per unit of metal worn away; (3) maximum coefficient of friction between tread and brakeshoe; (4) tread surface should allow maximum durability of shoe; (5) wheel should produce minimum wear on rail.

By means of enlarged charts he described the method of chilling the tread and a portion of the flange of chilled iron wheels, and described the character of the resulting metal. This he said consisted of combinations of carbon and manganese with the iron. At the tread, the carbon is retained in combined form by the sudden chilling and the resulting metal at this point is very hard, containing 3.5 per cent of combined carbon. Mr. Fox then described the condition of the metal at various points in the wheel from the tread to the hub, stating that the combined carbon gradually decreases and the amount of graphite increases, giving the desired physical characteristics for the various parts of the wheel. At a point near the hub, he said, a sample taken from a wheel would show 96.5 per cent iron and 3.5 per cent graphite and would have the characteristics of soft steel.

Mr. Fox further described the methods used in the manufacture, testing and inspection of chilled iron wheels. He also pointed out that the service results obtained depend to a considerable extent upon the service conditions on each property, and stated that machining, mounting and maintenance practice have an important bearing on the total life of the wheel.

### CAST AND ROLLED WHEELS COMPARED

Many of the members present engaged in a general discussion of Mr. Fox's paper, which, in general, resolved itself into a comparison of results obtained with rolled-steel and chilled-iron wheels. A considerable part of the discussion related to the subject of flat spots on chilled-iron wheels, resulting from skidding, in comparison with those on rolled-steel wheels. Mr. Montgomery attributed a considerable part of the difficulty with flat spots on chilled-iron wheels to the action of sand when used on slippery rails. He stated that the chilled-iron wheels tend to slide on striking the sand, whereas the steel wheel continues to roll. He reported the results of the practice followed in Madison for a time of washing greasy rail with a sprinkler instead of using sand. Under this condition the difficulty with flat spots on chilled wheels was largely eliminated. But his road was required to go back to the use of sand as a result of a ruling by the Railroad Commission.

In reply to a question, Mr. Fox discussed the variations in the thickness of the chill on the tread of chilled-iron wheels and stated that in the manufacturing process it was possible to control this thickness within comparatively close limits.

### AIR BRAKE DEVELOPMENTS

A. B. Wood, Westinghouse Air Brake Company, presented an illustrated paper describing the development of air brakes for light-weight cars. The importance of a proper understanding of the function of the air brake on the part of those who operate, supervise and maintain the cars was emphasized. In the proper selection of brake equipment, in supervising and insisting on proper instruction of operators and maintenance men, and in adopting standardized equipment on the various cars of a property, those in executive charge, Mr. Wood said, can do much to further safe and economical practices.

Mr. Wood pointed out the remedy for several recently detected causes of difficulty with safety control equipments. Among other things, the use of a choke fitting in a union close to the air whistle on interurban cars was recommended as a means of overcoming the difficulty from emergency action of the brake when the whistle is blown.

In answer to questions, Mr. Wood also discussed the problem of freeze-ups in air-brake lines and said, as a matter of design, it is almost impossible entirely to avoid this trouble. He also described the construction and operation of an anti-freezing device known as the Air Rectifier, which injects small quantities of alcohol into the system and which was reported by several of those present to have eliminated difficulty from freeze-ups.

The latest developments in automotive brakes were also described and illustrated by lantern slides. This included a description of the rotary inlet valve type of compressor which has been developed for this brake equipment.

### CLAIMS WORK DISCUSSED

On Friday afternoon W. T. Bie of Green Bay read a paper showing how the Wisconsin Public Service Corporation has collected more money during the past year than had been paid out in the settlement of claims. The paper will be abstracted in a forthcoming issue. It was discussed by Mr. McQuade of the Chicago, North Shore & Milwaukee Railroad, C. L. Hedges of LaCrosse and N. C. Rasmussen of Wausau. Mr. McQuade said that in a large city it was much more difficult to make the kind of a record cited by Mr. Bie. The North Shore Line, he said, felt that it was accomplishing good results when it held disbursements for claims within 2 per cent of the gross income. The latest figures obtained showed this figure to be approximately 1.6 per cent. He attributed the difference in the conditions of the large city and the small community to the greater difficulty of making and maintaining contact with the residents along the line and with the people of the town who make up juries. In addition he said that the ambulance chaser is always present in the larger city. He advocated the careful and continuous upbuilding of favorable public sentiment, founded on efficient service, as the best method of obtaining permanently improved conditions.

Mr. Rasmussen said that the practice in Wausau was to settle claims whenever possible and avoid lawsuits. Careful training of employees, and co-operation by all operating departments for the prevention of accidents, were held to be the most successful methods of holding the costs of claims to a minimum.

Commissioner A. L. McDonald, in a paper abstracted elsewhere in this issue, held that proper treatment of employees is necessary if they in turn are to be expected to make the proper kind of contact with the public. C. R. Mahan, Chicago, North Shore & Milwaukee Railroad, described several accounting practices of that road in a paper which is also abstracted elsewhere, and Dudley Montgomery of Madison presented a paper giving the result of a study of the growth of automobile and street car traffic with increases in population. From the results of his studies, which are given on another page, Mr. Montgomery expressed an optimistic viewpoint of the future of the industry. In his opinion, there has been no time during the past twenty years when the outlook for the electric railways was as bright as at present. He said that although automotive vehicles offered a type of de luxe service which appealed to certain classes of people, the possibilities of running special service with street cars for certain classes of patrons at increased fares had by no means received the consideration which it merited, and although a railway might be criticised for catering to a preferred class of passengers, such service was comparable with the operation of certain classes of bus service,

**and warranted careful consideration by railway operators.**

### ELECTION OF OFFICERS

**Acting on the report of a nominating committee, G. C. Neff, Wisconsin Power & Light Company, was elected president of the association; L. L. Tesslier, DePere Light & Power Company, was made vice-president, and H. A. Smith, Southern Counties Power Company, was elected treasurer. In the railways section, Dudley Montgomery, vice-president Madison Railways, was elected chairman, and N. C. Rasmussen, superintendent railway department, Wisconsin Valley Electric Company, Wausau, was made vice-chairman.**

# The Commission's View of Platform Men*

## Trainmen Cannot Make Up for Defects in Service for Which the Management Is Responsible—They Can Win Public Approval by Their Services Beyond Those Forming an Essential Part of the Job—They Should Never Be Censured in Public

BY ANDREW L. MCDONALD
Member Wisconsin Railroad Commission

THE Railroad Commission receives many forms of criticism from the car-riding public. Sometimes such criticism or complaint is the result of long-standing alleged inefficiency in service. Frequently it comes from people who spontaneously give vent to their attitude and feeling toward real or imagined disregard of the rights of the car-riding public. The motormen and conductors have quite as much to do with the relations between the public and the company as the board of directors or the manager. They are frequently made the target of complaint and possibly abuse for acts and conditions for which they are not at all personally responsible, but which acts reflect inefficiency or inattention of their superiors. Because of their intimate contact with the public, they have to be men of quick action and thought and should be imbued with absolute loyalty to the employing company. They must be, in the very nature of their employment, much more courteous and considerate than are the people who patronize the cars.

From personal observation as a mere patron of street railway and interurban service, as well as from my experience as a commissioner, motormen and conductors do not generally entertain a narrow and provincial view of the scope and character of their duties. They are not only required to load and unload passengers and run the cars so as to avoid danger to pedestrians and vehicles, but in general must be a kind of geographical encyclopedia and a source of wide information to the public. They are constantly bombarded with all kinds of questions, many of them wholly unrelated to the immediate service in which they are engaged. The employees who are building up a mutually helpful relationship between the riders and the company are those who meet these demands, as well as the technical duties they perform, with unfailing courtesy and sympathy.

The commission, of course, can only insist on such operation as will effectively care for the comfort, the safety and efficient transportation of passengers. It is self-evident that the motorman and conductor cannot make up for defects in equipment or service, for which superintendents and managers are primarily responsible.

The prerequisite importance of amicable and friendly relations between the company and the traveling public is constantly being more fully recognized by the transportation companies. It is not only what is done by employees close to the public that counts, but it is also the manner of doing things that is of vital importance. From my observation the present tendencies of street railway and interurban operation are toward the exercise of a very general spirit of helpfulness and care toward the patrons of the service. In fact, one frequently wonders at the extreme patience which these men exercise. There are, of course, exceptions to this general practice. There is an occasional grouch who does not appreciate or realize the value of courtesy and sympathetic helpfulness. Operators with such a narrow view will not answer the numerous questions that seem nonsensical and often without point. To the patron making such queries, however, the answer may be of vital importance. Even when unable to answer a question, the employees' manner may either give offense or may be such as to retain the friendliness and respect of a passenger.

### COMMISSION OBSERVERS GIVE EXAMPLES, GOOD AND BAD

In this connection general criticisms and deductions perhaps are of much less value than concrete illustrations. Pursuant to this thought I called together those of our staff whose duty it is to check up men in the operating branch of the service in question and asked them to tell me some of the things that had come to their attention within the last year in the different cities in the state, and a recital of some of these may be helpful to those charged with the immediate duties of operating the railway properties.

One of them said that recently during rainy weather a car in a certain city was very much crowded and those standing in the rear might easily have moved forward so as to permit several to board the car who were standing out in the rain. The conductor requested the passengers to move forward but was met by a noisy protest from a prominent man who shouted defiance to the effect that he did not propose to "crowd" forward for any one. This patron was thinking of himself and selfishly had forgotten all about the people standing out in the rain. The conductor bore the loud criticism with patience rather than to retort as most people would be inclined to do. Unquestionably he gained the approval and respect of all fair-minded and right-thinking persons in the car.

It was pointed out by the observer who reported this incident, and I feel deserves repetition here, that in this case the conductor used the term "crowd up forward, please." The word "crowd" is what annoyed the irate gentleman spoken of, and it would perhaps have been better to have used the word "move" forward, please, or "step" forward, please. The word "crowd" did not appeal to that observer as the proper term to use under such circumstances.

Of course, it is impossible for street car companies to expect their employees working for moderate salaries to be perfect Chesterfields in courtesy and manner. I am reminded of a story told of a newly appointed railway manager who was riding one of his own cars to observe the performance of the conductor and motorman. The specific conductor called out the names of the streets in such manner that it was impossible to detect the names by which such streets were christened. After some period of observation on the part of the manager he approached the conductor and chided him for his bungling and inefficient manner in attempting to call the names of the streets. The conductor asked him what business of his it was how he called the streets. With great dignity the manager declared his official capacity and advised the conductor to be more musical and accurate in his future street calling. To this the conductor replied with some heat: "What do you expect of a poor dub getting $75 a month in calling street names—grand opera?"

Many illustrations could be given to show that an unusual degree of judgment is required by street car operators. Quick thinking is sometimes necessary to avoid serious accidents. Another observer stated that recently an automobile was parked at the curb of a narrow street in a certain city. As a street car was approaching at the average speed another automobile was being driven in the same direction just in front of the car, but not on the track. The driver, in order to pass the standing automobile, suddenly and without warning turned upon the tracks immediately in front of the rapidly moving car. The motorman reversed the power and thus avoided what would otherwise have been a very serious accident, with possible loss of life. In this case no blame could have been attached had the collision occurred, but the motorman, through his training in alertness and quick wit, did what was expected of him. He saved the driver of the automobile from the results of his own folly.

Another observer reported recently seeing a conductor get off his car, lift on board a small child, then get off the car again and assist a crippled man to the car and help him to a seat. He later managed to find a seat in a very crowded car for a lady carrying a small child. Perhaps these acts might be interpreted as beyond the conductor's duties but they represent what the public receives in the way of service, purely from the humanitarian impulse which no doubt prompted the conductor in these instances. The public was better served because these acts saved time and allowed the car to proceed more quickly and to reach its destination sooner.

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*Abstract of paper presented before Wisconsin Utilities Association in Milwaukee, April 17 and 18, 1924.

Many other incidents of like nature might be cited. Those given are a fair sample of the courtesy extended to both deserving and undeserving patrons of street and interurban cars every day.

Supervisors and other operating men have their part in the scheme of public service, and they too will often be called upon to exercise judgment and discretion, which can hardly be said strictly to be included in their duties. In dealing with the men who are operating or maintaining the cars they should not fail to realize that these men are in a position often most trying and nerve-racking.

To illustrate, a short time ago a motorman was seen driving a car along one of the principal streets of a certain city when a little child suddenly darted squarely down the track in front of the car. Quick action brought the car to a stop within 2 ft. of the child. Do you think the motorman's nerves were such that he could at that time have endured any kind of criticism from a superior?

The same observer recently noticed a superintendent standing at a timing point in a certain city when a car approached with its signs improperly set, the two destination signs being in conflict. A bystander who was talking to the superintendent called attention to this. The superintendent stepped into the car and severely reprimanded the conductor in front of a carload of passengers. In the interest of service to the public and in common justice to the employee, this is one mistake on the part of supervising officers that the commission cannot condemn too strongly, and I might add too that it is not so very unusual. While it is true this conductor had made a mistake, and also true that his attention should have been called to it, it could have and should have been done simply by calling his attntion to it at that time and later, if it was deemed necessary, talking to him about it at the barn.

To you supervising officers I would say: Don't forget that your employees are just as human as you are, and sometimes perhaps just a little more so, and don't publicly criticise and censure them and then expect them to deal politely and civilly with the public. Don't forget you are their superior officers and that such criticism from you, especially if unmerited and unjust, irritates and angers them even though they are not in position to express their feelings to you. It is just natural that for some time after such public rebuke has been made it will be pretty hard for that particular conductor or motorman to deal civilly and courteously with the public. Don't forget that this conductor or motorman is your representative with the public and that his attitude and treatment of your patrons either adds to or takes away from the patronage of your company.

### RULES AT TIME OF ACCIDENT MUST BE FOLLOWED WITH JUDGMENT

Another little thing has come to our attention. There is a rule in force by practically all companies forbidding employees to give any information to the public in case of an accident. The rule may be well meant, but unless carried out with judgment, its workings may lead to absurdities.

To illustrate, some time ago a slight accident occurred in a certain city shortly after noon when many were going home to lunch. The car was disabled and could not be moved for a long time, a fact known by the car crew. Questions asked by passengers brought no replies from the trainmen, and after waiting for a long time many were compelled to go back to their work without being able to get home for lunch.

Within two or three blocks was another car line that would have delivered these people very near their desired destination. What harm could have resulted if the operators had been permitted to advise the passengers of the facts, which could not possibly have had any bearing on any damage claim that might later be made against the company? The men in charge of that car, or any other car, if properly instructed, can be trusted to exercise reasonable judgment in such cases, and a friendly feeling toward the company is sure to be engendered when people know that their interests are receiving as much consideration as the company's interest in a damage claim.

In conclusion, from my acquaintance with the average railroad man, I would say this: Make all possible effort to have your men properly instructed in their duties, pay them a wage that will keep poverty and want out of their thoughts, treat them as you would be treated yourself if your positions were reversed, and you will find they will respond and that such treatment will bring a splendid return in the way of public interest in your railroad and patronage of it.

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# Accounting Practice on the North Shore Line*

By C. R. Mahan
Auditor Chicago, North Shore & Milwaukee Railroad,
Highwood, Ill.

WE HAVE in practice three methods of accounting that differ somewhat from those in general use on other properties: First, cost department accounting for the engineers; second, centralized merchandise dispatch accounting; third, accounting for tickets issued by cash register machines.

There never was a time in the history of our industry that called for closer co-operation between the engineers and accountants than the present. Today it is very necessary that the accountants exercise the utmost care in correctly stating the cost of maintenance and also the outlay applicable to investment. The very nature of the work performed by the maintenance of way department is so diversified and so widely spread over the entire system of the carrier that constant and careful attention is required to differentiate between the expenditures properly chargeable to income and those which are chargeable to capital.

Carriers working under a budgetary control system endeavor to regulate their expenditures for upkeep and additions and betterments within the amount specified by the budget. In order that the engineers may successfully carry out their part of the program, it is essential that the accountants furnish them with accurate detail unit costs during the progress of the work. Should the engineers be compelled to wait until the work is completed before they are furnished with unit costs, they would have little chance to correct faulty organization; to detect inefficient labor, or to correct imperfect construction or maintenance methods. With these points in view and with the assistance and co-operation of our chief engineer, we organized a cost department under the supervision of the accounting department.

### IN CHARGE OF ENGINEER AUDITOR

This cost department is in charge of an engineer auditor, who has had considerable experience in handling cost work and is thoroughly familiar with the requirements of the engineering department as well as those of the accounting department. The personnel of this department was recruited from the engineering and accounting departments, and by this co-ordination of employees developed a combination of forces that had a concrete understanding of the requirements of each department and resulted in the installation of a system of accounting that by one continuous operation provides the engineers with a sectional unit cost report which shows the description of each account, account number, man-hours, money, unit and unit cost, and also summarizes the final result for the accounting department labor distribution entry.

It is our intention, in the near future, to extend the scope of this department so that it will also furnish all other departments with such unit costs as they may find desirable.

*Centralized Merchandise Dispatch Accounting.* The centralized system of merchandise dispatch accounting is in charge of the merchandise dispatch station accountant under the supervision of the auditor of merchandise dispatch accounts, who in turn reports to the auditor. The purpose of creating this department, in so far as practical, was to separate the accounting from the physical operation of the station.

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*Abstract of a paper before the Electric Railway Section, Wisconsin Utilities Association, Milwaukee, Wis., April 17-18, 1924.

The receipt of the original waybills for inbound traffic, the revision thereof, the issuing of merchandise dispatch (expense) bills with their component parts, mailing statements to credit patrons and collections and remittance of all charges, remain part of the agent's duties. The methods used were described in ELECTRIC RAILWAY JOURNAL for Sept. 1, 1923, page 329.

The merchandise dispatch accountant's office abstracts by tabulating machines all outbound and inbound waybills and miscellaneous items, furnishing the station agents with their copy and the traffic department with a copy of forwarded abstracts. Station accounts are kept in balance and reports furnished the station daily. The station agent sends in the daily cash sheet which is posted to the abstracts. Uncollected reports are drawn off by stations each month and the station furnished with a copy. All correction notices are sent out and all adjustments are made by this department as well as all refunds. The draft covering, however, is forwarded to the agent who makes the delivery, the agent taking up the paid expense bill.

This method of accounting results in uniformity and accuracy in abstracting and in keeping the station accounts in balance. The accountant's office is in possession at all times of the amount of uncollected charges, which results in an enforcement control over the agents to collect the charges within the time limit prescribed by the Interstate Commerce Commission, and also results in considerable saving of the traveling auditor's time in the actual checking of the stations, as the verification of the uncollected accounts prior to the current month is handled by mail in the accountant's office.

*Tickets Issued by Cash Register Machines.* We have now in operation 22 cash register machines issuing tickets sold by agents, and it is our intention to install additional machines in the stations not now equipped just as rapidly as the volume of business justifies the expenditure. These were described in ELECTRIC RAILWAY JOURNAL for Nov. 11, 1922, page 773.

The accounting for machine ticket sales is very simple, as it is not necessary to check a ticket case containing a stock of one-way tickets for each agent. The machines automatically list and total all tickets sold. The agent sends in the machine tape with his ticket report to the auditor of passenger accounts. The tapes indicate the destination point by symbols opposite the amount received for each ticket. These tapes are then tabulated on an analyzing machine that gives the total sales by stations for tickets sold from one station to every other station. This ticket analysis, previous to the machine installation, required the time equivalent to two and one-half employees. One operator now does the work, and in addition is distributing the various classes of accounts for the storehouse and summarizing our daily mileage reports for the month in accordance with our prescribed classification.

We have found by actual test that tickets can be issued more rapidly by machines than card tickets can be issued, and in addition the passenger gets a receipt. There is less opportunity for ticket manipulation as the ticket is automatically canceled when the hat check is lifted by the conductor and placed in the hat check holder. The machines have cut down our investment in printed one-way stock considerably. Ticket paper costs approximately 30 cents per thousand, while card tickets run all the way from 80 cents to $1.25 per thousand.

# Effect of the Automobile on Passenger Traffic[*]

**By Dudley Montgomery**

Vice-President Madison Railways,
Madison, Wis.

THE past fifteen years have been the most trying in the history of the street railway business. Together with the trials of war and much adverse legislation and criticism, the industry has had to meet the competition of the automobile.

In 1910 we were all worried about the possible diminution of street railway traffic due to automobile traffic, and yet at that time no one conceived of the ultimate growth of the automobile industry. The accompanying charts give the facts from 1910 to 1923, both inclusive, and represent what is considered to be conservative judgment from 1923 to 1930.

The chart for the State of Wisconsin shows the present trend of population and automobile ownership. Assuming that the population between 1920 and 1930 will increase by the same proportion that it did during the previous ten years, and that by 1930 there will be five inhabitants per automobile, we can expect a total of 600,000 automobiles in the state at that time. The chart for the city of Madison shows the probable increase in population, the number of passengers being carried and those that probably will be carried by the electric railway in 1930.

The many predictions of how many automobiles the country could support and the time when the enormous annual increase of production would slacken to a point commensurate with the normal growth of population have usually fallen short of the facts. I would call attention to only one comparison, which seems to provide some measure of future development; that is, that there are now more automobiles in the United States than there are telephones. I believe that an expansion much beyond this point will not prove to be the permanent saturation point.

The number of persons who, at present own automobiles but are using them less and less for daily service is increasing steadily. They find that the expense is greater than they care to assume, that the difficulty of finding space to park their cars is an annoyance, that the wear and tear on the automobile standing in the weather is another expense and that the time saved, if any, is of no great moment to them. The result is that they are using their automobiles mostly for pleasure riding.

The country is going through much the same kind of experience with the

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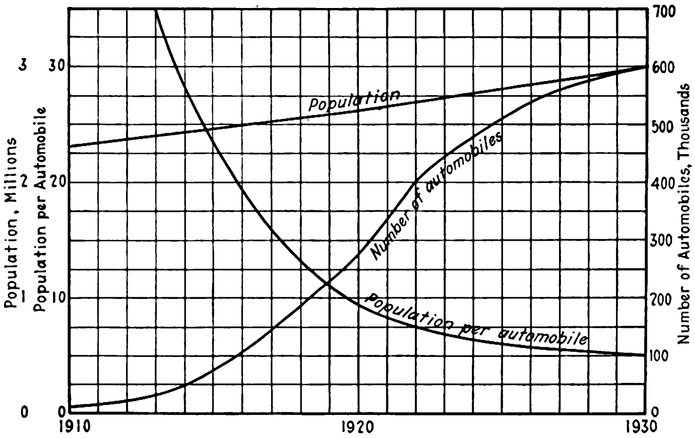
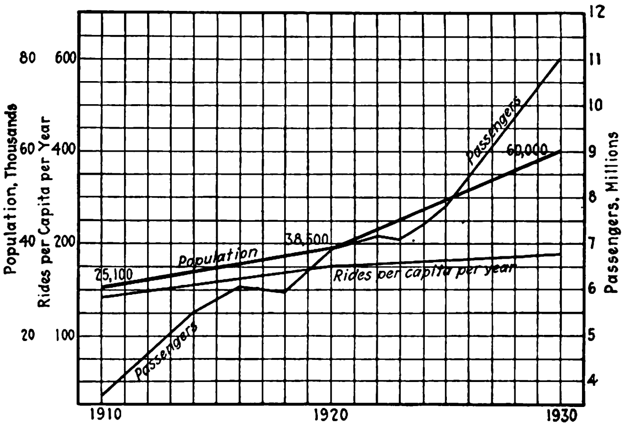
[*] Abstract of a paper before the Electric Railway Section, Wisconsin Utilities Association, Milwaukee, April 17-18, 1924.



Relation Between Population Growth and Automobiles, State of Wisconsin



Relation Between Population and Street Car Riding Habit, City of Madison automobile that it did with the bicycle, and a part of the novelty of automobile driving is wearing off. This is especially true where traffic congestion is serious enough to hamper and irritate the driver.

For some time we have been collecting data and making observations to determine the amount of traffic which the automobile takes from the street car, and two of the best illustrations which we have are comparisons between the month of March, 1923, and that of April, 1923, and between December, 1923, and January, 1924.

| | March, 1923 | April, 1923 | December, 1923 | January, 1924 |
|---|---|---|---|---|
| Passengers | 718,400* | 630,400 | 615,100 | 754,700 |
| Aver. per day | 23,950 | 20,600 | 19,800 | 24,300 |
| Difference | 3,350 | ....... | ....... | 4,500 |

*One day no service.

Each of these two combinations of months were comparable in Madison except that the weather in April and December was mild and beautiful, whereas March and January were cold and stormy. If we assume that the automobile travel during March and January was of a nature which used to be carried by horse or was new business peculiar to the automobile, we find that 14 per cent in the first instance, and 18½ per cent in the second, of the total possible traffic was accommodated by the automobile, and from 81½ per cent to 86 per cent by street cars.

From this and other information we find that the street cars are carrying, on the average, 80 per cent, or four-fifths, of the city traffic, and we believe that they will continue to hold this proportion. It must be remembered that the largest part of the automobile riding is new business developed by the automobile and cannot be considered as a loss to the street railways.

In coming to these conclusions, we are not forgetting the possibilities of urban bus operation. Such transportation is more likely to appeal to those now riding in their privately owned automobiles than to street car patrons, and we believe that we can compete with the bus in attractiveness of service. There is no doubt that the street car is still the service of lowest cost, and there is every reason to believe that, as the people settle down to a steadier existence, the street railways can look forward to a normal increase in their business based on increase in population and riding habit.

# The Electric Railway Situation Today*

## Securities Strengthened by Public Appreciation that Railway Is a Necessity and by Earnest Endeavor of Operators to Give Best Possible Service Under More Efficient Methods

By W. H. Sawyer
President East St. Louis & Suburban Railway, East St. Louis, Ill.

THE greatest advancement which has been made in the position of the electric railways has been the appreciation on the part of the public that electric railways, being a national and civic necessity, are entitled without question to make a fair return on a fair value. This has strengthened electric railway securities so that the buying public today has more faith in them as investments. This is especially true of the city electric railways, which today, speaking nationally, are in a fairly healthy condition and merit recognition from the investors. In fact, it is probably true that in the past year's market, which in general has possibly been somewhat inflated, electric railway securities have not come fully into their own.

One reason why electric railway securities are better investments today than before is the appreciation on the part of the investing public of the underlying necessity of electric railways. Another is the increased efficiency in mechanical production shown by the operators. A really fundamental reason is that the 1924 electric railway executive and operator has a more keen appreciation of the fact that it is his duty to give the very best service practicable for the rate of fare charged, and further, that it is his duty to give service in such a way that it will satisfy, in so far as it is humanly possible, the customers and the potential customers of his electric railway.

I care not where you go, there is a different attitude today on the part of the electric railway executive and operator. He wants to satisfy his public. We executives and operators who went through the horrible nightmare during war times learned our lesson and were brought to an appreciation of the fact that part of our troubles were of our own making.

Times and conditions have changed. The old flat franchise fare is gone, never nationally to return. Our customers today in different localities call it by different names, but in the last analysis street car fares today are in most cases based on the cost of the service. In no place does the customer pay more than the cost of the service.

There has for some time been a question in my mind whether regulation practically eliminating profits and practically restricting return on investment to the cost of money would not work out detrimentally in the end, but at the present time the theory of regulation on the basis of a fair return on a fair value and no more is, I am frank to say, giving very general satisfaction. There has also been a question in my mind whether the electric railway operator would be as efficient if all the efficiency went to the benefit of the car rider, but today this generation of electric railway executives and operators is more efficient than ever before. We have too big a job before us today to grow pessimistic over the possibilities of what may happen in the next generation. If, however, we continue to have regulation, and the customer is protected from paying more than the cost of the car ride, including, of course, a fair return on a fair value, it is essential that careful thought be given by all to see to it that the investor is given a fair return on a fair value. Otherwise there will be no investors, and then there will be no electric railways —but that to me is unthinkable. Electric railways must continue and investors must, therefore, continue to be willing to invest in electric railway securities, and the people must, therefore, continue to be willing to allow the investor a fair return.

Another new phase which has come about due to the general adoption of this service-at-cost idea is the desire on the part not only of the electric railway companies, but of their customers also, to have eliminated those items of expense which are not part of the cost of the car ride. Years ago when conditions were different, when there was no regulation, when there was a flat rate of fare, every concession forced out of the company was considered a benefit to the civic community. Under today's condition expense saddled by the community on the car company is paid by the car rider. The company and the customers both want to see the lowest practicable fare for good service. The company and the customers both want to see all unfair expense eliminated from the cost of the car ride.

One of the best illustrations of an unfair expense charged against the cost of a car ride today is the paving tax. In communities working under old-time franchises the car rider still pays for the paving between the car tracks, although this paving is not needed by the car rider, is not worn out by the car rider, and does not even deteriorate due to the electric cars. It is in keeping with the spirit of changed conditions that new franchises are eliminating this paving tax, and rightfully so. The car rider should not pay for paving worn out by vehicle owners.

Upon examining some figures a while ago I noticed that the Kansas City Railway had invested in pavements and viaducts more than $5,000,000. It seems unthinkable that a company with gross earnings of only about $10,000,000 should have to invest more than $5,000,000 in pavements and viaducts, and maintain and keep in repair such pavements and viaducts. Interest, depreciation and taxes should certainly be taken as high as 10 per cent on this $5,000,000. This means $500,000 a year to be paid by the car rider for fixed charges on pavement and viaducts. To maintain this paving alone would cost on the average approximately $200,000 a year.

I am not well enough acquainted with the local situation to hazard an approximation as to the cost of maintenance of viaducts, but there is no question but that the street car riders in Kansas City pay, exclusive of regular state, county and city taxes, upward of $800,000 a year for indirect taxes which no other business is called upon to pay. There is no question but that the Kansas City car rider has to pay considerably more than ½ cent of his car fare for these inequitable indirect taxes. It is therefore not to be wondered at that where new franchises are being granted the car riders are asking for the elimination of these indirect taxes and imposts.

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*Abstract of paper presented before Missouri Public Utilities Association at Kansas City, Mo., April 9, 1924.

In some instances the street car company is asking for the elimination and it is being opposed by the elected representatives of the community. This is, I believe, due to the fact that there is not yet a full appreciation of the fact that the car rider must eventually pay for the cost of the car ride—and no more. Once this fact is appreciated and understood, mayors, city councils or city commissioners will not ask that the burden of these indirect taxes be put upon the car riders, who are mostly the working class of people, for the benefit of the community at large.

### RAILWAY MEN STUDYING THE BUS

No electric railway man gets to his feet today to talk without touching upon what we call the bus situation. It was only a few years ago that electric railway men shuddered at the mere mention of the word "buses." They had in mind the jitneys, which for a long period almost sapped the lifeblood of many companies, including the local company here in Kansas City. The average electric railway man is not disturbed today when you mention buses. It is one of the problems which he is studying—studying from an analytical, unprejudiced standpoint. Buses are going to be used more and more as time goes along by electric railway men in fulfilling their transportation duties to their communities. In many cities the electric railway man is today rightfully using a considerable number of buses to supplement and round out his transportation service.

There are objections to buses, especially in some localities, and especially on some streets in some localities. The bus as a vehicle does not carry as many people as the street car does as a vehicle, and from the status of the art today it is impracticable for it to do so, and to transport the same number of people therefore requires more buses than street cars. Bus transportation costs more per passenger carried than does street car transportation. Buses add materially to the downtown congestion, which is one of the biggest problems electric railway men and civic communities have to solve. I do not believe that bus operation should be independent of the street and interurban car facilities, but I do believe that every electric car man should give serious thought as to whether buses operated by the railway company are not necessary to round out and complete the transportation needs of his community. But buses should not be allowed to compete in such a way as to take away the cream of the traffic from the electric cars in which the people now have their money invested, and upon which the people finally must depend for service.

A short time ago while in Chicago at a convention similar to this I listened to a well-meaning man talk about educating the public by the use of publicity. I took the ground that the man meant right but that he was wrong in his phraseology. The public does not need to be educated, but we need to be educated, we electric railway executives and operators. I think the facts are that none of us are yet fully educated either as to the proper quantity or quality of publicity or advertising, but we are on our way, we are on the right path, in that we are today conducting our business as other successful men conduct their businesses, giving full service for value received, giving efficient service, and acquainting our customers through the newspapers with all the facts surrounding our business, which in the final analysis is really their business.

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# I. C. C. Considers Mail Rates

## Association Committee Presents Extended Report on Proper Basis for Determining Charges to Be Paid for Electric Railway Mail Service

THE question of the proper charges to be paid by the Post Office Department to the electric railways for the haulage of mail is now before the Interstate Commerce Commission. For years the electric railways have believed that they were underpaid for the services which they render in the haulage of mail matter, and under the direction of a committee of the American Electric Railway Association they have been endeavoring to secure an increase. The last rate schedule established by the Interstate Commerce Commission went into effect Dec. 1, 1920, but has been found inadequate in a number of particulars. Since that time both the association and the department have been compiling data on the subject and these data have been presented as exhibits to the commission. The final step in the effort to secure fairer rate for mail service took place April 10, when W. H. Maltbie, as counsel for the association, filed with the commission a brief discussing the evidence so far submitted. This brief occupies a pamphlet of about 116 pages. The following is a summary of the principal points made in it:

### THE PRESENT RATES

Briefly, the present rates are:

Class I. R.P.O. service.—In this service the railway furnishes and transports either a full car or a compartment for the exclusive use of mail, but all the work in connection with the handling of the mail is done by the regular employees of the department. The rate is based per car mile on the linear length of the car, or compartment, as follows: For each linear foot of car length up to 20 ft., 1¼ cents per mile; for each foot of length over 20 ft., ¾ cent per mile.

Class II. Independent cars.—This class covers those cases where the car or compartment, at least during the time when it carries the mail, is used exclusively for the post office department, but the mail is handled by the employees of the transportation company. The present rates allow for the additional service of handling and responsibility for the mail an additional charge of ¼ cent per mile for each foot of car or compartment length up to but not exceeding 20 ft.

Class III. Closed pouch service in baggage or express cars or compartments.—In this form of service the mail is carried, with other express or baggage, in a baggage or express car or compartment. It is handled entirely by the employees of the transportation company and is given preferential treatment in that space must be provided for any quantity tendered, and as the space occupied must be carried after the mail is discharged to the end of the run, an additional allowance is warranted. The rate which has been paid for this service is 1 cent per mile per foot of car length used for mail, plus a surcharge of 2 cents per car mile to cover handling, preferential treatment, excess haul and responsibility, but applicable only to the first unit of each shipment. In other words, this surcharge is 2 cents per shipment-mile.

Class IV. Closed pouch service in passenger cars or compartment.—This comprises cases where the mail is carried in passenger cars or passenger compartments, all handling being done by the company. As there is even greater responsibility in protecting the mail against loss and damage than in Class III, the rate is slightly higher, i.e., the base rate is the same as Class III, but the surcharge per shipment-mile is 3 cents instead of 2 cents as in Class III.

### BASIS OF THE PRESENT CASE

After an experience of about two years, the railway companies requested the reopening of the case on the ground that the rates were inadequate. To determine what were fair rates, a questionnaire was prepared by co-operation between the representatives of the post office department and those of the American Electric Railway Association, designed to secure the information desired by both parties. Many valuable data were secured. These data have been accepted by both parties. Some testimony was also presented during the hearings through witnesses, particularly by A. S. Richey and Thomas Conway, Jr. Some of the points in which it was found that the department and the companies differed will be mentioned.

The method of determining the revenue length of car, particularly the extent to which the platform should be considered as part of the length of car, was one point of difference. In an effort made to determine the actual cost to the company of the service, there were differences in opinion as to the proper method of apportioning some of the expenses, whether the Federal income tax should be treated in the accounts as an operating expense and the proper "fair return" to allow, the department proposing 5⅝ per cent and the carriers asking for 8 per cent of the fair value. There was also a disagreement as to the space to be considered as "occupied," particularly in Class IV service.

### CARRIERS PROPOSE RATES

The position of the carriers before the Interstate Commerce Commission was that the rates should be based on the cost of service, plus a fair return, but that as the cost varies with each city, it is more practicable to take the average cost of all electric railway transportation as a base rate. In the absence of operating figures for the entire country, the average figure of the 151 railway companies from which data were obtained in this study of mail rates is taken. Then the cost per car foot mile may be obtained by dividing the total operating expenses and other costs of the railway systems by the total revenue car foot mileage. The "fair value" of the properties, for the purpose of this determination, may then be taken as 4.35 times the total annual operating expenses, and on the value thus obtained, the fair return should be figured at 8 per cent.

In developing the reasonable rate on the basis of this cost, the carriers' brief said that in general mail service is divided into three classes: (A) Full car service, (B) full compartment service, and (C) fractional service. Classes A and B are subdivided according to whether mail is handled by the post office employees or by the railway employees, and Class C is subdivided according as the fractional service makes use of freight, express or passenger equipment.

The brief then says that the proper basis for rate making is the cost per car mile or the cost per car foot mile, plus a fair return, with proper discount from the car mile rate for short length cars and proper surcharges for: (a) Special service not demanded in passenger traffic, (b) fractional or l.c.l. service, (c) necessary excess run, due to demand for service between points other than termini of existing car runs and (d) the fact that the mail service is an ordered service.

The brief then points out that the revenue length of the car should be taken to include one-half of all platforms. The rates per car foot mile would then be shown in the tabulation at the top of the next column.

COMPUTATION OF CAR FOOT RATES

| | | |
|---|---|---|
| 1. | Total number of cars covered by study | 26,502 |
| 2. | Total number of car miles | 574,892,000 |
| 3. | Car-foot miles (Post Office Department's estimate) | 20,742,000,000 |
| 4. | Increase in item 3, due to addition of one-half of platform length in freight, express, mail and express-mail cars, and one-fourth of platform length in passenger—express and passenger—mail cars | 0.251 per cent |
| 5. | Corrected total car foot miles (item 3 multiplied by 1.00251) | 20,793,000,000 |
| 6. | Operating expenses | $204,084,942 |
| 7. | Taxes, other than federal income tax | $15,852,192 |
| 8. | Federal income tax | $1,080,191 |
| 9. | Miscellaneous debits | 50,557 |
| 10. | Lease of road (net balance) | 5,376,206 |
| 11. | Total cost, exclusive of fair return | $226,444,088 |
| 12. | Total cost per car mile in 1921, exclusive of fair return (item 11 divided by item 2) | 39.38 cents |
| 13. | Total cost per car mile, October, 1923, exclusive of fair return (97 per cent of item 12) | 38.20 cents |
| 14. | Total cost per car foot mile in 1921, exclusive of fair return (item 11 divided by item 5) | 1.089 cents |
| 15. | Total cost per car foot mile, October, 1923, exclusive of fair return (97 per cent of item 14) | 1.056 cents |
| 16. | Fair return expressed as a percentage of fair value | 8 per cent |
| 17. | Ratio of fair value to total operating expenses | 4.35 |
| 18. | Fair return expressed as a percentage of operating expenses (item 16 multiplied by item 17) | 34.8 per cent |
| 19. | Car mile cost plus fair return, October, 1923 (1.348 times item 13) | 51.49 cents |
| 20. | Car foot mile cost, plus fair return, October, 1923 (1.348 times item 15) | 1.42 cents |

### THE BRIEF SUGGESTS TWO METHODS

In applying the rate thus obtained to the full car R.P.O. rate, the brief suggests two methods. One is that the full car mile cost of 51.49 cents be subject to a discount of 25 per cent for cars less than 28 ft. The other is that there should be a base rate of 65 per cent of the total car mile cost of 51.49 cents, or 33.46 cents, to which there should be added for each foot of car, 35 per cent of the car foot rate of 1.42 cents, or 0.50 cent per mile.

Where the railway company pays the labor costs for handling, an additional charge of 1.5 cents per linear foot per mile is recommended, pending a more accurate determination of the cost, with a reduction to 0.75 cent per linear foot per mile for full car or full compartment service. For R.P.O. apartment service, the rate recommended is the base rate of 1.42 cents per linear foot of apartment, plus the present short length surcharge of 25 per cent for the first 20 ft. and 25 per cent discount for any portion of the apartment over 20 ft. in length.

The suggested rates for closed pouch or express car or compartment service are based on a unit of 30 cu.ft. This figure is obtained on the assumption that 30 cu.ft. are equivalent to 1 linear ft. of an 8-ft. car, in which mail is piled to a height of 5 ft., with a 2-ft. aisle. The rates recommended are:

CLOSED POUCH BAGGAGE OR EXPRESS CAR OR COMPARTMENT RATE

(For Units of 30 Cu.Ft.)

| | Cents per Mile |
|---|---|
| First unit | 4.5 |
| Second unit | 4 |
| Third unit | 3.5 |
| Fourth unit | 3 |
| Additional units | 2.75 |

CLOSED POUCH PASSENGER CAR OR COMPARTMENT RATE

| | Cents per Mile |
|---|---|
| First unit (10 bags) | 7 |
| Second unit (sufficient volume to make total for first and second units 60 cu.ft.) | 6 |
| Third unit | 5 |
| Fourth unit | 4 |
| Additional units | 3.5 |

The brief explains at length the basis for these figures, and includes, in the data given, interesting figures on the average load factors on cars on different railway systems. The load factor, in this connection, is defined as the revenue passengers per car mile, multiplied by the average length of ride in miles, and divided by the average seats per car. Recent figures for various properties were declared to be:

| | Per Cent |
|---|---|
| Easton (Pa.) Transit Company | 37.43 |
| Nashville Street Railway | 39 |
| Public Service Railway of New Jersey | 39.72 |
| Springfield (Mass.) Street Railway | 46.8 |

Recent figures on average length of rides in different cities were also quoted. They are given in the following table:

| | Miles |
|---|---|
| Cleveland, Ohio | 3.11 |
| Chicago, Ill. (surface lines) | 4.16 |
| Detroit, Mich. | 4.06 |
| Milwaukee, Wis. | 2.93 |
| Nashville, Tenn. | 2.5 |
| Philadelphia (surface lines) | 2.71 |
| San Francisco, Cal. | 2.4 |
| Springfield, Mass. | 2.88 |
| Worcester, Mass. | 2.5 |

In connection with the proposed rates, the carriers declare that there should also be a minimum charge for a mail route, but as it is difficult to determine with any degree of accuracy what it should be, they suggest a minimum charge not less than 1.42 times the one at present in force. This will make the new minimum charge approximately $250.

## New Reports Available

SPECIAL reports and compilations on the following subjects prepared by the association staff during the past month are now available to member companies upon request.

*Working Conditions of Trainmen*: A new edition of the association's regular bulletin based on up-to-date information covering hours of labor, length and types of runs, layover time, overtime rates, extra compensation allowed for special types of work, number of trainmen, labor turnover, etc.

*The Problem of Traffic Congestion*: Extracts from reports of traffic surveys and leading articles on the traffic problem in city streets giving a general survey of traffic conditions and brief specific surveys of some of the leading cities, including descriptions of methods adopted to relieve congestion in certain cities, the results obtained and also some theoretical solutions of traffic problems which have not actually been tried out. Discussion of the comparative efficiency in the use of the streets by passenger automobiles, buses and street cars is also included.

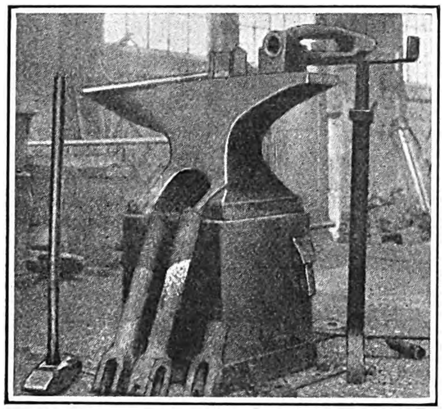
*Trend of Trainmen's Wages in* 1914 *to* 1923: Shows for a large group of companies the maximum wage rate and the number of years of service necessary to reach it for the years 1914 to 1923, inclusive.

In addition to the above, supplements to the Wage Bulletin, Fare Bulletin and Cost of Living Studies have been prepared, bringing them down to date.

# Maintenance of Equipment

## Closing Ends of Turnbuckles for Rethreading

When the threaded ends of turnbuckles become worn, it is desirable to rethread them. This requires that the hole be closed in sufficiently to permit the tap to cut a thread of standard size. This work is carried on very efficiently in the shops of the Philadelphia & Western Railway, Norristown, Pa., by use of swages of the particular shape necessary for the hexagonal ends of the turnbuckles. In closing in the ends, the turnbuckle is heated in a forge, and the end is placed in the bottom swage which is placed in the hardy hole of an anvil. The top swage has a handle. When this is held in position on top of the turnbuckle a couple of blows from a sledge will close in the end and retain the proper exterior shape. After the turnbuckles have been cooled they are again threaded in a bolt threading machine.



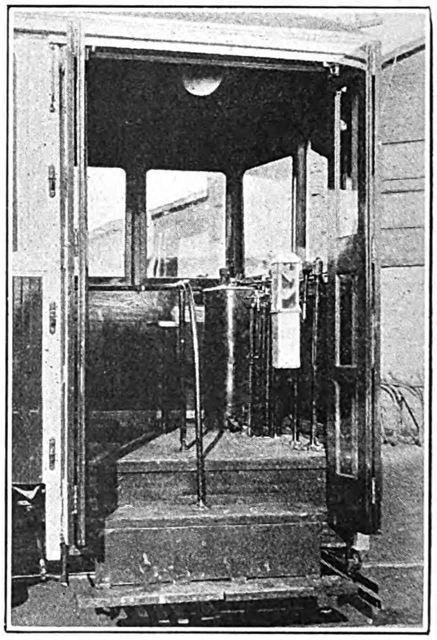
Turnbuckle in Position for Closing in Ends

Threads on the brake rods also become worn. If there is sufficient stock remaining the rods are upset and rethreaded. Otherwise they are cut off at an angle, and a new end is welded on. This is then rethreaded to proper dimensions.

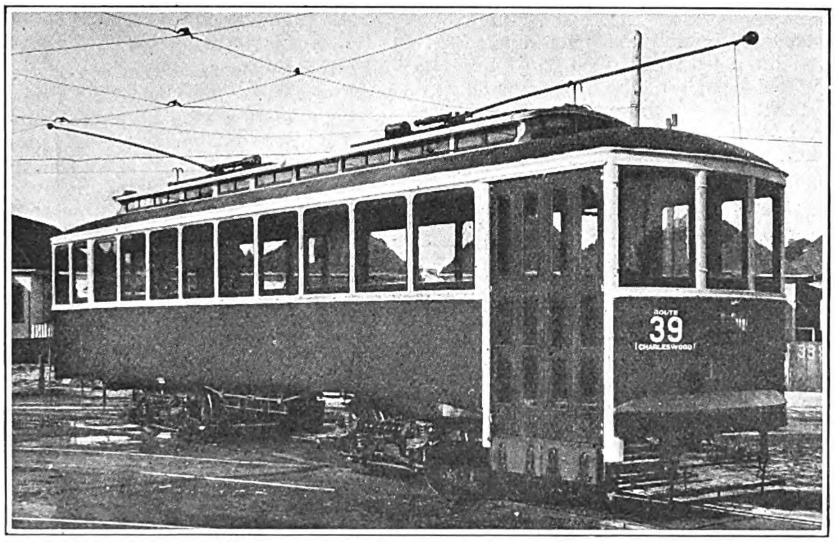
## Protect Passengers Against Drafts

Severe climatic conditions prevailing in Manitoba have influenced the design followed in the reconstruction of four double-truck double-end cars by the Winnipeg Electric Railway. These have been converted into one-man safety cars for service on suburban lines. Swinging doors separate the interior of the car from the vestibule in order to protect the passengers against drafts.

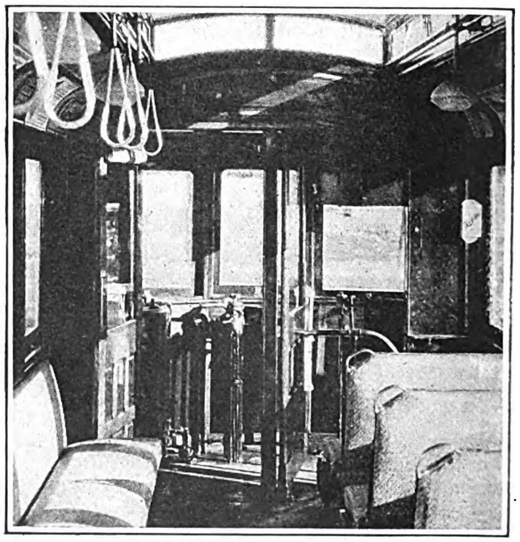
The platforms are flush with the car floor, but there are two steps between the platform and the ground. The lower step is of the folding type and is connected with the door operating mechanism. A second step is in the form of a well inside the doors. This arrangement prevents drafts entering the car through a crack under the doors. Entrance and exit doors are operated individually by means of a selective mechanism manufactured by the Safety Car Devices Company. The cold air coming in the car interior is thus reduced to a minimum. A Peter Smith heater is located in the center of the car in order to distribute the heat evenly.



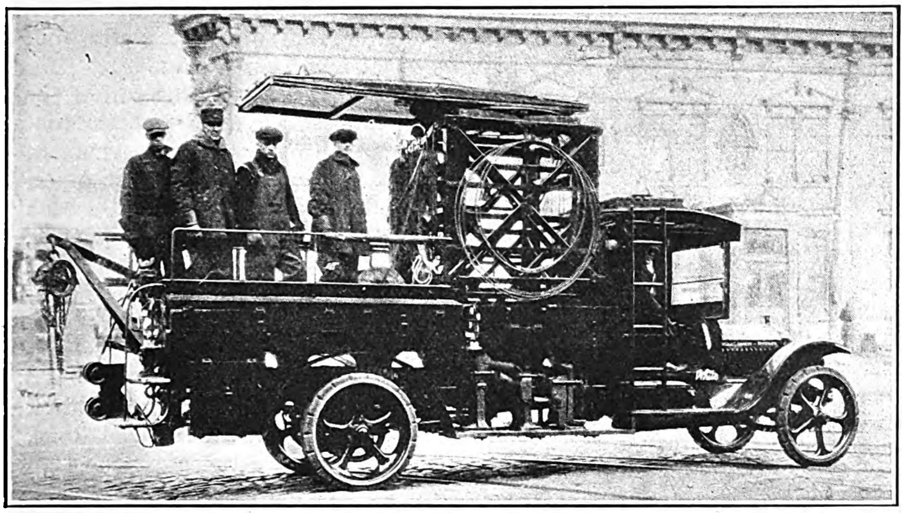
Double Doors, Separately Controlled, and Step Arrangement on Rebuilt Winnipeg Cars



Four Cars of This Type Have Been Converted by the Winnipeg Electric Railway for One-Man Operation on Suburban Lines



Swinging Doors Separate the Vestibule from the Car Interior in Order to Prevent Drafts



Combination Truck for Line Maintenance and Emergency Car Work

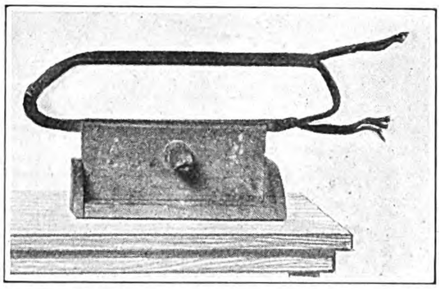
## Combination Line-Emergency Truck

A NEW truck which can be used for overhead maintenance as a line truck and as an emergency truck for rolling stock has recently been placed in service by the New York & Queens County Railway, New York, N. Y. The chassis is a White 2½-ton model with a McCardell three-section tower mounted on it. Special running boards are provided on the sides and three jacks are carried on either side and a stone jack on the rear step, making a total of seven jacks carried by the truck. A four-wheeled buggy for moving vehicles with broken axles is also carried on the rear. Provision is made for a portable hoisting arm, which may be attached to the rear end and used for hoisting an automobile that has been disabled on the track. This hoisting arm functions the same as the hoist on an ordinary garage wrecker and when not in use it is slid into a compartment located under the truck flooring. A full set of materials and tools for maintaining overhead lines is carried on the truck as well as the wrecking tools.

In addition to this tower truck, the company has also placed in service a Ford 1-ton truck, and through the addition of these two is able to retire a stable of five horses, two horse-drawn tower trucks and two horse-drawn freight trucks and to eliminate one line crew. By the use of the new trucks for car emergency calls a wrecking car previously used by the company has almost been eliminated.

## Vise Holds Armature Coils

A HAND VISE constructed of wood of the type shown in the accompanying illustration has been found a great convenience in the armature room of the Eighth Avenue Railroad, New York. The hand vise is made entirely of wood with two upright jaws mounted on a wooden base. The front jaw is moved back and forth through the use of a hand screw in the center. The armature coil to be taped can be placed in the vise and quickly fastened. In taping coils it is most convenient to provide so that they can be swung around at various angles during the taping process. The particular advantage in using a hand vise of the type shown is that this can be fastened to the bench by a "C" clamp and can then be shifted to a position most convenient for the winder.

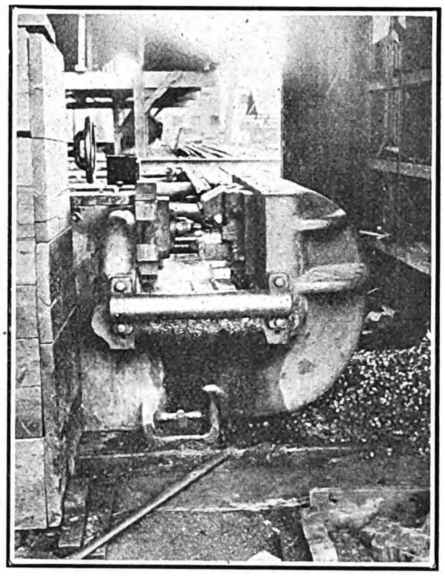


Convenient Form of Hand Vise for Taping Armature Coils

## Rail Saw, Punch and Bender

RAILWAY systems which are a long distance from the producer have to install more shop and yard equipment than if they were closer to the source of supply. Among the appliances owned by the Spokane United Railways, Spokane, Wash., is the extensive installation for cutting, punching and bending rails shown in the accompanying line illustrations.

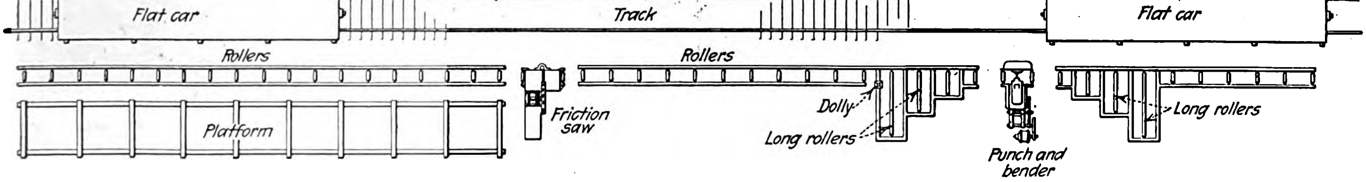
The plan shows the track on which flat cars, loaded with rails to be cut and punched, are brought into these yards. From these cars the rails are skidded to an adjoining platform and are then placed on rollers which carry them to the friction saw. Here the worn ends are cut off. They are then run down another set of rollers to the punch and bender, where the ends are punched or the rails are bent.



This Machine Punches and Bends Rails

It will be noticed that the rollers on each side of this bender are of various lengths. These are to permit the 60-ft. rails, while being bent to a short radius curve, to lie workwise on the rollers.

An accompanying illustration shows the bender and punch used as a punch. In the background will be seen the rail saw and roll-way. It will be noticed that both rail punch and rail saw are housed to protect them from the weather.

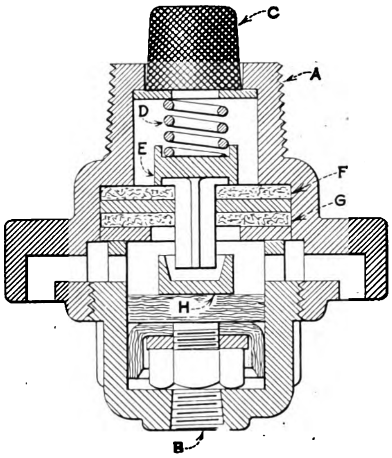


Plan of Installation for Cutting, Punching and Bending Rails in Spokane

# New Equipment Available

## Automatic Drain Valve for Car Reservoirs

A NEW type of automatic drain valve for car air reservoirs is being placed on the market by the Columbia Machine Works, Brooklyn, N. Y. The action is somewhat similar to the air-operated slack adjuster for brakes, in that each application of the air causes the discharge of the water accumulated in the reservoir since the last brake application.



Automatic Non-Cumulative Drain Valve

In this way the water is removed practically as fast as it is condensed, and does not have a chance to freeze and prevent proper action of the brakes.

The manner in which the device operates may be seen from the following description:

Referring to the accompanying diagram showing the construction details, the threaded part, marked *A*, is arranged to screw into the main reservoir. There is a pipe connection at the bottom from the opening *B* to connect with the brake cylinder of the car. With each application of the brakes air is admitted from the brake cylinders through the opening *B* to the drain valve.

With the valve in position in the main reservoir, any water which may accumulate passes through the strainer *C* and into the valve chamber *D*. A small valve, *E*, is held on its seat at *F* by the main reservoir air pressure and also by a spring which seats on the top of the valve.

With each application of the brakes, brake cylinder pressure is admitted at *B*, which raises the valve *H* and also valve *E*. This produces an opening from the chamber *D* to atmosphere, so that any moisture which accumulates in this chamber is blown out as the valve is lifted from its seat. When the valve *H* reaches its upper position it seats against the rubber gasket *G*, and thus closes the opening to atmosphere. With the release of the brakes the valves again take their normal position and in so doing there is again a short blow of air from the chamber *D* to atmosphere, which carries any moisture out of the chamber *D*.

This type of valve has been installed upon a number of electric cars, and is giving satisfactory results. It is made entirely of brass, and is arranged to screw into the main reservoir in place of the usual drain cock.

## Removable Top for Double-Deck Bus

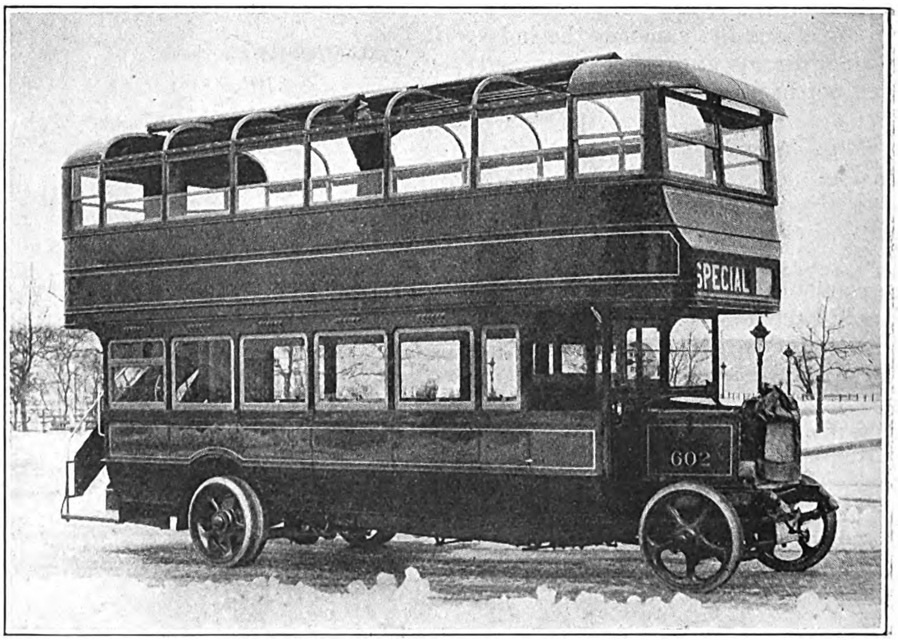
A DOUBLE-DECK bus seating 64, with a top designed to make the upper deck comfortable every day in the year, has been placed in service by the Fifth Avenue Coach Company, New York. To make the 38 seats on the upper deck available in cold and inclement weather and at the same time have the upper deck attractive for open-air riding on pleasant days a removable semi-glass inclosed top equipped with drop curtains and a roll cover roof of light waterproof material has been provided.

The top is bolted to the rail of the upper deck and is inclosed both front and rear with glass and a permanent section of roof. There is also a permanent roof over the aisle. On each side of the aisle roof is a roll cover, which, when lowered, forms the roof from the aisle to the top of the windows. These two roll sections can be lowered in a few minutes by the conductor.

The lower half of each upper deck window is covered with a fixed 10-in. glass panel, while the upper portion may be closed with a roll shade. This, when lowered, overlaps the upper edge of the glass panel, so that rain, snow or sleet cannot get in. With the overhead covers and side curtains down there still is plenty of light entering the inclosure through the front, rear and side sash. Electric lights mounted just above the windows illuminate the interior at night.

In general appearance the bus shown in the accompanying illustration resembles No. 601, a 60-passenger double-decker, which was exhibited at Atlantic City last October. The additional seats in No. 602 have been provided by extending the upper deck beyond the driver's vestibule. This also affords additional safety when driving, as the overhang forms a visor to the windshield, protecting it from rain or snow.

The new bus was manufactured by the New York Transportation Company.



Sixty-four-Passenger Bus with Removable Top Equipped with Roll Roof and Side Curtains. This Arrangement Is Designed to Make the "Open Deck" Usable All Year

# The News of the Industry

## Subway to Replace "L"

### A Four-Track Trunk Line to Be Built on Sixth Avenue, New York City, Within Five Years, Maybe

A subway under Sixth Avenue, New York City, extending from Trinity Place to Fifty-ninth Street was recently approved by the Transit Commission. Later the commission suggested the subway be extended under Central Park and then east to Queens. It will be a four-track trunk line and as approved is an adaptation of the proposal first advocated by Julius Miller, Borough President of Manhattan, for tearing down the Sixth Avenue elevated and constructing a subway in its place, provided the property owners along Sixth Avenue pay the cost of the change through assessments. A large number of them have consented to a 10 per cent assessment, believing this would cover the cost as outlined below. But the commission points out that the cost will require a 20 per cent assessment. The elevated structure is not to be removed until after the completion of the underground system.

### COST ESTIMATED AT $60,000,000

The commission points out that the estimated costs are affected by the existence of the Hudson & Manhattan structure in Sixth Avenue from Ninth Street to Thirty-third Street. Of the four new tracks, two used for express purposes will have to be built beneath the existing Hudson and Manhattan tracks, and of the two used for local purposes one must be built on either side of the existing tracks and at a depth sufficient to avoid interference with the Hudson & Manhattan stations. Other engineering difficulties will be met in dipping the new line under the Pennsylvania Railroad tubes at this point. These engineering difficulties will add about $7,000,000 to the cost of the subway.

The engineers estimate that the mere destruction and removal of the Sixth Avenue Elevated line would cost $500,000, less whatever sum might be realized through the sale of the scrapped material. Further, that the amount of the award the courts in a condemnation proceeding would allow the railroad for its property is entirely conjectural. But in allowing $49,000,000 as the cost of the subway, the commission assumes that the total cost of acquiring and destroying the old line and of building the new would be not far from $60,000,000. It also says that during the year ended Dec. 31, 1923, 153,409,605 passengers were carried in both directions by the two lines, the Sixth and Ninth Avenue branches, from Rector Street station to the terminus of the joint line at Anderson and Jerome Avenues in the Bronx. Traffic checks indicate that 60 per cent of this total, or 94,000,000, were carried either to or from stations on the Sixth Avenue branch, and approximately 59,000,000 to or from stations on the Ninth Avenue branch below Fifty-third Street.

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## Details of Detroit Trackless Trolley Plan

The Detroit Department of Street Railways plans to use trackless trolleys as feeders to the East Warren extension. Announcement to this effect has been made to the City Council by Ross Schram, assistant general manager of the municipal system. Extensions of the tracks for about 1½ miles are planned and if the trackless trolleys are found available they will probably be run from ½ mile to 1 mile beyond the terminus of the proposed track extensions.

The costs of laying tracks and providing overhead lines is estimated at $100,000 per mile, while for trackless trolleys the cost of the overhead equipment is placed at $10,000 a mile, with cars costing about $9,000 each.

The municipal officials plan on putting a number of trackless trolleys in service in the outlying districts where the population does not warrant the laying of expensive tracks, provided the cars sent for examination and experiment prove satisfactory, as the city was authorized by a charter amendment passed two years ago, to purchase and operate trackless trolleys.

Announcement has been made that the D.S.R. officials expect to pay up within five years the $5,000,000 bond issue voted last spring by the aid of monthly sums set aside from the earnings. The monthly sums will take care of the interest on these bonds and part of the principal. The new cars purchased are to be paid for without depleting the bond issue or financing by so-called car trust certificates. As the cars are delivered, it is planned to have the controller obtain the necessary money on notes, charging the payments to the fund for additions and betterments.

The notes are to be taken up with a fund established by the setting aside of a definite monthly sum. It is anticipated that all of the notes will be written off in a maximum of five years, $4,000,000 having been spent for rolling stock.

The $1,000,000 available this year from bonds, it is estimated, will take care of all reasonable demands for extensions and will be sufficient to build 10 miles of track. While petitions have been received asking for the construction of from 30 to 50 miles of track, only 20 to 25 miles of track are necessary now, according to Mr. Schram.

## City Would Buy Lines

### Purchase Negotiations Under Way in Chicago—Proposal First Step in Plan to Co-ordinate Service

Negotiations between representatives of the city of Chicago and officials and representatives of security holders of the Chicago Surface Lines and Chicago Rapid Transit Company on the subject of municipalization of Chicago transportation systems are being carried on in a series of meetings held in Mayor Dever's office. These meetings, which are being held at the invitation of the Mayor, have for their purpose the formulation of a plan whereby the city may purchase the transportation properties by the issuance of so-called "Schwartz certificates."

Preliminary negotiations on the subject of the proposed purchase have been under way for some time between legal representatives of the city and of the security holders. In addition to the question of the legality of the proposed Schwartz certificates, which must be definitely determined in order to assure their marketability, the price to be paid for the railway properties and the organization and control of the proposed board of control which would operate the combined properties must be settled before further progress can be made.

### COMPANIES IN RECEPTIVE MOOD

The Mayor's proposal to purchase the existing transportation properties is the first step in his general plan for the co-ordination of the service of the elevated and surface lines, to be followed by expansion of the existing systems, and the construction of subways.

At a meeting held in the Mayor's office on April 22 there were present Samuel Insull and Attorney Patrick J. Lucey for the Chicago Rapid Transit Company, Henry A. Blair and Leonard A. Busby for the Chicago Surface Lines, together with Frank O. Wetmore, president of the First National Bank; A. W. Harris of the Harris Trust & Savings Bank, and M. A. Traylor of the Illinois Merchants Bank. As representatives of the city there were present Mayor Dever, Corporation Counsel Francis X. Busch and Alderman U. S. Schwartz, chairman of the local transportation committee. Another meeting of the conferees was set for April 24.

Mr. Busby had previously indicated that the management intends to do everything possible to reach an agreement with the city on a basis which will recognize and adequately protect the rights of the owners of the property and accomplish the city's desired purpose of bringing about a unified transportation system, with adequate provisions for extensions and improvements to meet present and future transportation needs.

## More One-Man Cars

### Buffalo Company Changing Over to One-Man Equipment Except on Main Lines

One-man cars are being placed in service on a majority of the local lines in Buffalo by the International Railway as part of an economy campaign. Herbert G. Tulley, president of the company, explained the International sustained a deficit of $1,000,000 last year and it is essential that every operating economy known to electric railway practice be used in Buffalo.

Trainmen operating one-man cars on the local lines of the International receive 5 cents an hour more than the regular scale. It is said that none of the present trainmen will lose his position because of the operation of cars with only one man, but that the company will stop hiring new men for a short time.

The one-man system of car operation is being adopted on all the lesser traveled lines in the city. One-man cars now are being operated on the William, Abbott Road, Elk, Hoyt, Connecticut, Clinton and Chicago Street lines. They will soon be placed in service on the Jefferson line and on May 18 the new system will go into effect on the Sycamore Street line. Other lines will be added to the list as rapidly as the cars can be changed over in the company's shops.

#### HEADWAYS REDUCED

On the Sycamore Street line, where the new system will go into effect on May 18, the headway will be reduced from ten and a half minutes to seven and a half minutes at midday and during the rush hours from three minutes to two and a half minutes. A similar plan will be followed on other lines where one-man cars are being placed in operation.

Mr. Tulley says that an investigation covering a period of a year on lines where one-man cars have been in operation shows that accidents during loading and unloading have been reduced to a minimum. He said that on lines operating cars with two trainmen there has been an increased number of accidents during loading and unloading.

The one-man cars will not be placed in service on the more heavily patronized through lines in the city where speed in starting and stopping in congested areas is essential in order to keep to schedules.

The City Attorney has advised the City Council that there is nothing in the franchise or in the city ordinances which would force the company to operate cars with crews of two men. This opinion by the city law department has kept the Council from seeking the aid of the courts to require the company to man cars with two men.

## Buses and Trucks Supplementing Service in Utica and Rome

Motor buses and express trucks are supplementing the electric service of the New York State Railways on the Utica, Rome and interurban lines. Beginning April 28, a large passenger bus will operate between the American Corner and railroad station in Rome, in addition to the 20-minute trolley car service. The bus body was constructed in the railway shops at Utica and has a seating capacity of 25 persons. It is mounted on a Brockway chassis.

Utica has a passenger bus of the same type which is used mostly for sightseeing purposes. The route is over the city's beautiful boulevard. This bus is equipped with a body built by the Kuhlman Car Company and has a Brockway chassis. Early in June the company will inaugurate a commercial trucking service between Rome, Utica and Little Falls and intermediate points. Four White automobile chassis have been purchased and bodies are now under construction at the company shops. The express line will be operated under the name of the Utica Railway Coordinated Bus Lines Inc. The trucks will be of 2½ and 3½ ton capacities.

## Seven and Three-Quarter Cents Needed in Baltimore

Hearing on a petition filed by the United Railways Company, Baltimore, to be permitted to put into effect a new schedule of rates and charges was started by the Maryland Public Service Commission on April 22 and is attracting great public attention. The hearing is expected to continue for several days. The original petition as filed by the railway company did not fix a specific figure to which it desired to increase the fare from the present 7-cent rate. On the first day of the hearing it was said by the counsel of the United that in order to accomplish what it desires he believes the company should have a rate of about 7¾ cents.

The original petition asked that the company be permitted to maintain rates which would yield an annual net income of $1,500,000. This figure was cited because in 1920 the Public Service Commission set $1,000,000 as the minimum annual net income and the company pointed out that at the same time the commission had decided that $1,500,000 was "reasonable, necessary and in the public interest" and placed upon the company the burden of increasing the net income to that figure by exercising economy and efficiency.

The figures placed before the commission at the opening of the hearing were submitted by William H. Maltbie, counsel for the United. Joseph C. France, also representing the company, addressed the commission on the need of additional revenue on the part of the railway. In its petition as filed recently the company said that in 1923 only $976,266 was earned and in the four years from Jan. 1, 1920, to Dec. 31, 1923, the total net surplus was $3,454,365, which is $2,545,635 below what should have been made under the annual rate of $1,500,000. In the opening arguments for the company it was declared that the $500,000 had been saved by economy and efficiency in operation, but this saving had been eaten up by other circumstances. The saving was made, it was declared, but the company cannot control the riding habits of the public and the demands for extra service.

## Non-Parking Rule Helpful

### Traffic Is Speeded Up in Downtown St. Louis by Enforcement of Recent Ordinance

Marked improvement in traffic conditions in downtown St. Louis has resulted from the strict enforcement by the police of a city ordinance abolishing the parking of automobiles and other vehicles on Olive Street between Third and Twelfth Boulevard.

So successfully has the new plan worked out that the Traffic Council, which has been placed in control of vehicular traffic in the city through the recently enacted traffic code, has decided to extend the no-parking rule to Washington Avenue. Parking will be abolished on Washington Avenue from Fourth Street to Eighteenth Street during the morning and evening rush periods. This will provide a free line of traffic by which the morning and evening peak can flow freely into and out of the congested district.

The maximum time now required for a street car to make the trip from Twelfth Boulevard and Olive Street east to Fourth, north to Locust, west to Broadway, south to Olive and thence west to Twelfth Boulevard is ten minutes less than before the new law went into effect. The clocking was done on April 7 and April 9, during the peak of the rush hours. A survey made by the research department of the United Railways on Oct. 23, 1923, showed that this trip required a maximum of thirty-three minutes. The recent survey showed a maximum of twenty-three minutes.

#### EXTENSION OF PLAN PROPOSED

The elimination of parking on Washington Avenue is expected to be even more beneficial. That street is the gateway for East St. Louis and other East Side cities into St. Louis and is used by the four bus lines now operating in St. Louis, the Page, Park and Compton divisions of the United Railways and hundreds of service cars. With cars parked along the curb this throws most of the heavy traffic onto the railway tracks and street cars and buses lose most of their time in the territory east of Eighteenth Street.

Experts for the United Railways have found that motorists now use Olive Street for a speedy exit from the congested districts. Instead of trailing the street cars and running continuously on the tracks, these machines are able to pass between the tracks and the curb. On other streets where parking is permitted from ten to twelve machines line up in back of every street car and very frequently a street car or bus loaded and ready to go is held up by a minor mishap to an auto.

Elimination of parking on crosstown streets will greatly speed up traffic on both Washington and Olive Streets, experts of the railway say. The survey conducted by the railway in October, 1923, and circulated under the title "Rush-Hour Car Movement in the Congested District" is regarded as having played an important part in the action of the Traffic Council in forbidding parking on Olive Street and the decision to curb parking on Washington Avenue.

## East Boston Tunnel Changed Over to Train Operation

By joining forces with the Boston Transit Commission, so as to muster a working crew of about 800 men, the Boston Elevated Railway changed over the service in the East Boston Tunnel between 8 o'clock on the evening of April 18 and 5 o'clock on the morning of April 21 from surface cars to the operation of four-car trains. It was a stupendous job. The tunnel was closed to the public during the fifty-seven hours. Then the crossovers were broken, the guard rails taken down, the third rail installed for a distance of 2 miles and platforms erected at the several stations. This was work which could not be done until the surface cars ceased running. Its completion was accomplished in record time, however, as everything was ready for the work the minute the cars were out of the tunnel. All the platforms had been built in small sections which fitted together like a picture puzzle. The third rail had been welded together in lengths of 400 ft., all ready to set in place.

Forty new steel cars have been purchased by the Elevated for this service, the trains to run between Maverick Square in East Boston and Bowdoin Square in Boston, meeting surface cars at both ends. The new work cost about $2,500,000. It makes the total cost of the East Boston Tunnel approximately $9,000,000. The Elevated pays the rental on this sum to the city of Boston.

## Question of Confiscation Involved in Florida Suit

The United States Supreme Court granted a writ of certoriari on April 21 by which it will review the decision of the Florida State Supreme Court in a suit brought by the city of Palatka against the Southern Utilities Company. The company had a franchise secured from the city in 1914. Owing to the increase in costs due to the war, the company later gave notice of an increase in rates of gas. The city sought an injunction on the ground that the rate named in the franchise was a contract obligation. The city was sustained by the trial court and by the State Supreme Court. The company alleges that the rate is confiscatory and that there is no rate-making power delegated by the Legislature of Florida to the municipality.

## Puget Sound Property and City of Seattle Must Pay Taxes

Under a ruling of the United States Supreme Court, the city of Seattle and the Puget Sound Power & Light Company will be compelled to pay taxes totaling $401,000, on railway property for the period from September, 1918, to March, 1919. The case was the outcome of the railway purchase by the city, which was contracted in the fall of 1918, but was not consummated until March, 1919. Under the contract, the city was to pay three-fourths and the company one-fourth of the taxes due for this period. When the company started suit to prevent collection of its one-fourth the city joined. The city contended that if the company were to be exempted from the county taxes, the city should also be exempted. The Supreme Court of the United States, in refusing to grant a rehearing of the case, upheld the Supreme Court of the State of Washington.

## Will Investigate Cincinnati Property's Books

Carl H. Nau, head of the firm of Nau, Rusk & Swearingen, certified public accountants of Cleveland, Ohio, was sworn in as Master Commissioner to examine the books, papers and records of the Cincinnati Traction Company by Judge Robert S. Marx, in the Hamilton County Superior Court on April 7. Appointment of the master commissioner is the result of a suit filed by Attorney Robert Alcorn, as a taxpayer, against the traction company to compel the payment of franchise tax deficiencies amounting to $1,050,000. Hearing of the suit started on April 1. Judge Marx decided to have an expert accountant go over the traction company's books and obtain data desired, so as to get at the bottom of the case. Attorney Alcorn objected to the procedure. W. Kesley Schoepf, president of the traction company, then offered to provide $5,000 out of his own pocket to finance the accounting of Mr. Nau.

The hearing on the matter has been postponed until Mr. Nau completes his investigation.

In defining the details of the work of the investigators the court assumed the validity of the service-at-cost franchise under which the traction company is now operating.

## City to Co-operate with P. R. T. on Refund

Approval has been given by the committee on transportation and public utilities of the City Council of Philadelphia to an ordinance authorizing the city to join with the Philadelphia Rapid Transit Company in an effort to secure a $5,000,000 income and excess profits tax refund from the government. Provision is also made in the measure that the money refunded or saved through an exemption of the company from similar taxes in the future shall be used only for additions, extensions and betterments of the city's street railway transportation. The railway's appeal for a refund was turned down.

**Forty-four per Cent in Wages.**—The Philadelphia Rapid Transit Company's employees received in wages 44 per cent of the fares collected in 1923. In *Service Talks*, the official publication of the company, the story of what happened to each 6¼-cent fare last year is shown in graphic form. Four per cent provided the dividend on the $30,000,000 of paid-in capital. Twenty-four per cent was used to pay other operating expenses, including cost of power and maintaining equipment, with 22 per cent paying interest on bonds and rentals. This left 6 per cent going to the city, state and federal governments in taxes.

## Municipal Ownership Advocated

A recommendation that the city of St. Louis pass a bond issue of $51,000,000 for the purchase of the United Railways was made by L. R. Bowen, chief engineer of the division of bridges and buildings, Department of the President, Board of Public Service, in an exhaustive report submitted on April 18 to E. R. Kinsey, president of the board.

Mr. Bowen details a plan whereby he contends the city can take over the railway and provide for needed extensions without additional cost to the citizens and with no increase in the present fare of 7 cents with universal transfer. He states that the trend is toward municipal ownership, pointing out that of all the cities that have embarked upon this venture none had the opportunity of taking over a transportation system under the auspicious circumstances St. Louis enjoys.

The presentation of the report caused quite a stir in administration circles. Mayor Kiel and Mr. Kinsey disclaimed the report. The Mayor expressed surprise that Mr. Bowen had submitted the report, stating that the first he knew of it was when he read a synopsis of the report in a St. Louis morning newspaper. Mr. Kinsey, too, declared that he was unaware that Mr. Bowen was to submit a report on his studies of transportation methods in other American cities, and that he certainly did not order it or authorize such a report to be made.

### CITY'S EXPERT DISAGREES

Rolla Wells, receiver of the United Railways, declared that the price of $51,000,000 would wipe out the holders of the common and preferred stock in the company. Mr. Wells said:

> I ran for Mayor of St. Louis years ago on an anti-municipal ownership platform. I was opposed to public ownership then, and I have no reason to change my stand now. Mr. Bowen's proposal goes back directly to the utility of municipal ownership. As receiver for the United Railways, I am not in a position to comment directly on the report. I have no authority to sell the property, being simply its custodian for the federal court.

Mr. Watts, chairman of the reorganization committee, pointed out that the $51,000,000 valuation was merely set for rate-making purposes, and that that valuation had no relation to the price which the buyers might pay for it.

C. E. Smith, the city's expert on public utility matters, said that while he was in accord with the principal of municipal control of public utilities he was not ready to say that this could best be accomplished by municipal ownership. He said that St. Louis is not in the same relative position as Detroit to force a low purchase price. In St. Louis the company's principal franchises do not expire until 1929. Other rights do not expire until 1942 and still others not until 1948. Mr. Smith said that after studying the experiences of American cities with their street railways, he was convinced that better results could be obtained through municipal control such as is exercised by the city of Cleveland under private ownership and municipal supervision than under municipal ownership and operation.

## Wage Demands in Pittsburgh Cannot Be Met

The demands of the 3,200 trainmen of the Pittsburgh Railways, Pittsburgh, Pa., cannot be met at the present time, A. W. Thompson, president of the Philadelphia Company, announced in a letter to President Winters of the City Council, without creating a deficit in the revenues of the company. He stated that the increased wages would create a loss which would have to be offset by increased fares. He invited suggestions from the Council on the matter of the increased wage demand.

In a memorandum accompanying the letter and signed by Thomas Fitzgerald, general manager of the railway, it was brought out that all available income was necessary now to meet operating expenses of the system. Mr. Fitzgerald also reported that the meeting on April 21 with the men was largely a repetition of former meetings. He said that no new arguments were being presented by either side.

The conductors and motormen have asked for an increase from 68 cents an hour to 75 and 77 cents for the first and second years respectively. The present wage scale expires May 1.

## Buffalo Company Wins First Damage Suit in Dynamite Case

The International Railway, Buffalo, N. Y., has won the first suit brought against it for damages as the result of injuries alleged to have been sustained by a passenger on the Buffalo-Niagara Falls high-speed line interurban train which was wrecked at Ellwood Station in August, 1922, by dynamite claimed to have been placed by strikers. The suit was the first of a series of such actions for $40,000 damages. The case was heard in the United States Court for the Western District of New York. The jury was out two hours and returned a verdict of no cause of action. Counsel for the International argued the company was not responsible for injuries sustained by Mrs. Anna Hanna, Philadelphia, one of the wreck victims. He suggested that the suit should be brought against the Buffalo local of the Amalgamated Association, members of which, he charged, dynamited the track and caused the wreck. The company introduced testimony to show that everything possible was done by the company to protect its passengers.

## Texas Interurban Planning to Build

With the completion of organization of the Texas Rapid Transit Company, announcement is made that the construction of an electric interurban line linking Austin and San Antonio, Tex., is assured. The line as contemplated would pass through the towns of Lockhart, Seguin, San Marcos, New Braunfels, Gonzales, Cuero and Yoakum.

The company has taken over all rights held by the Seguin & Guadalupe Valley Railway, organized in 1914, before the World War, by W. B. Dunlap, Beaumont, and Dr. E. W. Brown, Orange. This company has secured much of the right-of-way for its proposed line between San Antonio and Seguin and grading had commenced when operations were halted by the war. The first unit of the proposed Austin-San Antonio electric line will be built between San Antonio and Seguin.

The proposed electric line will be approximately 100 miles long. It is estimated that its completion will require an investment of more than $7,500,000. E. G. Potter, San Antonio, is president of the company.

## Settlement of Los Angeles Damage Suit Shown

When the case of Mrs. Julia H. J. Henderson against one of the local Los Angeles railways, was called for argument recently in Judge Fleming's court it was stricken from the calendar. This indicates that a settlement has been effected out of court. The case was considered an important one from a legal standpoint, as it involved the question of whether a traction company can be held liable for damages by permitting more passengers to enter a car than can be accommodated with seats.

Mrs. Henderson sued the railway for $10,150 damages for injuries she asserted she received June 9, 1923, when a car in which she was a passenger, lurched suddenly, hurling her against a rear section. She contended the company was negligent in permitting the car to become overcrowded and with failing properly to provide passengers with seats. In an answer to the suit, the company stated that if the plaintiff became a passenger when the car was overcrowded she did so voluntarily and therefore assumed the risk of possible injury with her own knowledge. The defendant contended that probable injury was to be anticipated at the time Mrs. Henderson boarded the car.

## Arkansas City Councils Pass Ordinances

The City Councils of Little Rock and North Little Rock, Ark., have passed the ordinances necessary to permit the Inter-City Terminal Railway of North Little Rock to cross the new Main Street bridge connecting the two cities. Under the plan agreed to the company will charge a 6-cent fare for the privilege of crossing the bridge from any part of either city, but should a passenger desire to proceed beyond the bridge line he must pay an additional 2-cent fare for a transfer.

Officials of the Inter-City company have announced their intention of speeding up the laying of the double track on the bridge so that the service can be put into effect about May 1. The company, which has been granted a twenty-six year franchise for the use of the bridge, will pay Little Rock $25,000 cash and $35,000 in partial payments and also will receive credit for $40,000 for laying the new tracks for the new franchise. The franchise ordinance provides that future interurban lines shall be permitted to use the new bridge on equitable terms, and in the event the railways cannot agree on that point the city shall decide it.

## Terminal Plan in Trenton Abandoned

The plan to build a large central terminal in the heart of Trenton, N. J., for the suburban lines of the Trenton & Mercer County Traction Corporation, New Jersey & Pennsylvania Traction Company and the Public Service Railway has been abandoned. The three companies announced that the costs would be prohibitive. The site selected for the proposed terminal has been purchased by the Trenton & Mercer County Traction Corporation and a terminal for that company alone will be built.

The idea of creating such terminal was conceived by Mayor Donnelly of Trenton, and indorsed by the other members of the commission. The plan contemplated by Mayor Donnelly provided for the acquisition of all property along the north side of Perry Street, between North Broad and North Warren Streets, and to whatever depth might be required for the purposes in view. Preliminary surveys made by City Engineer Swan indicated that this location would be well suited to the proposed establishment of a terminal. Fulfillment of the project, it developed, would cost in the neighborhood of $1,500,000 and none of the companies, it was understood some time ago, would agree to enter upon such expensive undertaking.

## Free Transportation a Menace in New Orleans

At the request of Commissioner Paul H. Maloney, of the Department of Public Utilities at New Orleans, President Flowers of the New Orleans Public Service, Inc., has sent the commissioner a list of the free trippers for the month of February. The list shows that the holders were given 167,646 rides during the month. At 7½ cents a ride this represents $11,735 for the month. This is a decrease of 2,680 rides from the number of passes issued in January.

Accompanying the list was a communication from Mr. Flowers in which he outlined the policy of the company in regard to granting free transportation to employees of the Public Service, Inc., stating additionally that it is the usual rule of practice with all companies regarding whose practice he has knowledge to give its employees unlimited passes, while New Orleans occupies a unique position in this that the practice is curtailed. He said:

> We give transportation to those of our employees who are required to ride on the cars, or to make visits in the interest of the development of our business. In addition, the contract with the union requires free transportation to employees in uniform and also to all other members covered by the contract. Policemen, firemen, and female members of religious orders in their garb ride without passes.

Mr. Maloney regards every free ride as a factor in preventing the lowering of fare. He has announced his intention of having an auditor check the books of the company for the purpose of determining whether the railway division of the company is being credited with service furnished the other departments.

## Eighty Cents Sought in Detroit

Although the new wage demands adopted April 19 by the motormen and conductors on the Detroit Department of Street Railways have not yet been officially presented to the Street Railway Commission, platform men, according to Herbert Meeker, president of Division No. 26, are asking a wage for two-men car operators of 72 cents an hour for men in their first six months of service, instead of 62 cents as at present; 76 cents an hour for men in their second six months of service, instead of 66 cents, and 80 cents an hour instead of 70 cents after one year of service. For overtime (more than eight hours) time-and-a-half is asked, instead of 75 cents an hour now given; for owl cars the request is 90 cents, instead of the 80 cents now prevailing, and for crews placed in charge of snow plows $1 an hour.

The union also asks that 25 per cent of the runs be straight day runs, 25 per cent straight night runs, 30 per cent of the runs to be completed in eleven consecutive hours, while the remaining 20 per cent must be completed in twelve and one-half consecutive hours. A shift of more than six hours would be considered a full day under the new plan.

Operating expenses of the system would be increased $1,025,000 for the year if the increase asked were granted. This would wipe out the estimated net earnings of $960,000 for the year and probably make it necessary to abandon the program of rehabilitation or increase fares.

In case the formal demands of the men are not met, arbitration will probably be asked of the Street Railway Commission. The city has never recognized a union among its employees on the ground that the charter forbids it.

## Washington Railway Men Get Two Cents Increase

At a meeting of the directors on April 19 it was decided to increase the pay of the motormen and conductors of the Washington Railway & Electric Company, Washington, D. C., 2 cents an hour, following a similar increase to Capital Traction employees, which was referred to in the ELECTRIC RAILWAY JOURNAL, issue of April 19. The new scale is 52 cents for the first three months, 56 cents for the next nine months and 58 cents thereafter. Operators of one-man cars will receive 63 cents an hour. In making the increase, the Washington Railway & Electric Company announced that it would abandon the quarterly cash prizes heretofore awarded for safety-first work.

## Ordinance Introduced for P. R. T. Bus Line

An ordinance granting the Philadelphia Rural Transit Company, a subsidiary of the Philadelphia Rapid Transit Company, a franchise for operating a motorbus line between Mount Airy Avenue and Germantown Avenue was introduced recently in Council by Councilman Smith and was referred to the committee on transportation and public utilities.

The ordinance provides that the franchise shall not be regarded as an exclusive privilege that would prevent the city any time hereafter operating buses of its own on any of the streets. The fare, subject to the approval of the Public Service Commission, is 10 cents for a one-way trip, with the 3-cent exchange tickets to surface or elevated connecting lines of the P. R. T. Another provision is that the earnings of the Philadelphia Rural Transit Company accruing directly or indirectly to the P. R. T. shall be applicable to the payment to be made to the city under the provisions for the retaking of profits contained in the agreement of 1907.

## Oklahoma Union Authorized to Charge Higher Fare

The Oklahoma Union Railway has been authorized by the Corporation Commission to put into effect the same rates of fare that are now effective over the lines of the Tulsa Street Railway between all points in Tulsa and West Tulsa within the city limits. The company has been operating for several years on a 5-cent fare within the city limits and contended that it had been losing money on this fare basis since 1919. On Jan. 15, 1924, it filed an application with the commission seeking an increase in its city fare from 5 cents to 7 cents, or four tickets for 25 cents, the latter rate being the charge that the Tulsa Street Railway had been receiving for city passenger fares. The Corporation Commission finds that for the year ended Dec. 31, 1923, the net revenue of the Oklahoma Union Railway for both city and interurban fares was $17,481. Further, that this amount was not sufficient to pay the interest on outstanding bonds of the company.

The Oklahoma Union Railway is primarily an interurban railway. It also operates about 4 miles of line in Tulsa and handles approximately 1,500,000 passengers a year in that city. The commission also approved an agreement between the Oklahoma Union Railway and the Tulsa Street Railway for transfer exchange at specified points.

## Twenty per Cent Increase Asked in Toledo

In a new contract submitted to the officials of the Community Traction Company, Toledo, the employees have asked for a 20 per cent wage increase and changes in working conditions estimated to cost the company an additional $400,000 annually. The men now receive 50, 52 and 55 cents an hour. They demand 60, 63 and 65 cents an hour. The present contract will expire on May 21.

In addition to the direct wage boost the men want two weeks' vacation with pay, closed shop on the entire property, and many changes in working conditions.

Company officials have intimated that they will submit the demands to Street Railway Commissioner Cann and the city officials before they undertake negotiations which might lead to a drastic increase in fares.

Last year's wage increase cost $15,000 a month and resulted eventually in a fare increase.

## Fares Advanced in Indianapolis

Seven-cent cash fares with four tickets for 25 cents, double transfers and a 1-cent transfer charge will become effective on the lines of the Indianapolis Street Railway, Indianapolis, Ind., on May 20, under an order issued by the Indiana Public Service Commission on April 18. The company is ordered to extend its service to Broad Ripple by Sept. 1, this year, under penalty of having the increased fare revoked if it does not make the extension by that time. Ten-cent owl fares remain as at present. The commission did not grant the request of Indianapolis city officials for seventeen tickets for $1. The order declares rerouting of the lines is essential both to the railway and its patrons. A decision on new routes is deferred for a supplemental order after the commission obtains suggestions from city officials and other sources. Nothing in the order indicates the period for which it will be enforced.

The present rate in Indianapolis is 5 cents with a 2-cent transfer charge. It was the contention of the company that this rate could not provide sufficient revenue to enable it to rebuild its property. The matter of the need for an increase in the fare of the company has been under discussion for three months under a renewed plea asking relief.

## Trial with Reduced Fare in Hornell

Raymond E. Page, new receiver of the Hornell Traction Company, Hornell, N. Y., has asked the Public Service Commission for authority to permit a trial of reduced fares for a period of ninety days. The company is said to have considered the advisability of abandoning operations, but hopes that a reduced rate will stimulate travel and increase revenues. The filing of the formal application with the commission is really a step in the previously announced program to cut rates.

Traffic on the Hornell line has been decreasing. Robert W. Bull, former receiver, resigned on April 3, 1924, and Mr. Page was appointed to succeed him. Mr. Page said:

> I have taken the office of receiver for the purpose of revising the plan of operations, lowering expenses and reducing fares in an effort to continue operations. I believe a reduction of fares will increase the traffic. My desire is to make the effort and ascertain the results. It is of great importance that this be done at once, as delay is injurious in the present situation and the financial condition of the company.

The railroad now operates in two zones with an 8-cent fare in each. A 7-cent fare is to be substituted for the ninety-day trial.

Twenty metal tickets for $1 will be sold by conductors and ten metal tickets for 50 cents at certain places in Hornell and Canisteo. A twenty-ticket book will be sold for $1.40 good in either direction between Hornell and Cook's Switch and between Canisteo and Crittenden. These tickets are good only on Canisteo cars except from passengers boarding local cars at the Erie shops or other industrial establishments and transferring to Canisteo. No commutation tickets will be sold. Transfers will be issued in zone 1.

## News Notes

**Seeks Dissolution of Bus Line.**—The Washington-Virginia Railway has filed with the State Corporation Commission a petition asking that the certificate of the Alexandria Motor Bus Line, Inc., be revoked. It is claimed by the railway that continued competition of the bus line will make it impossible for the railway to render profitable service.

**Difficulties in Wichita.**—In order to operate the Wichita Railroad & Light Company, Wichita, Kan., profitably fares will have to be increased or competing buses eliminated. This opinion was recently expressed by A. M. Patten, general manager of the property, before members of the City Commission. He said that net earnings for 1923 showed a marked decrease compared with previous years.

**Course for Electric Metermen.**—The University of Colorado, Boulder, Col., during the week of March 17 to 22, held its Second Annual Metermen's Short Course. This course is given through the extension division and is in direct charge of Professor C. M. McCormick of the electrical engineering department, who also has charge of the electrical standardizing laboratory. The course was not given for electric railway motormen, as was stated in the ELECTRIC RAILWAY JOURNAL, issue of March 29, but for electric metermen of public utilities and others who wished to attend.

**Wages Advanced.**—The Morris County Traction Company, Morristown, N. J., has granted a wage increase of 5 cents an hour to all the platform men. The company is now operating all cars with one operator. None of the employees has been laid off. As passengers enter the car the operator hands them identification tickets, which indicate the zone in which passengers boarded the trolley.

**Offers Old Car Bodies for Sale.**—The Brooklyn-Manhattan Transit Company, Brooklyn, N. Y., is offering for sale to its employees the bodies of single-truck cars that have been withdrawn from service on the surface lines. The bodies may be purchased by employees for $25 each and will be delivered to the purchasers at any of the B. M. T. surface line depots or terminals. The bodies can be converted into livable bungalows or camping quarters.

**Expropriation Methods to Get Property.**—Ninety-three pieces of property involved in the North Rampart-St. Claude Street cut-off of the New Orleans Public Service, Inc., from Esplanade Street, recommended to be acquired in the Beeler traffic report, will be effected by an ordinance adopted by the Commission Council. The city of New Orleans and the company are jointly to bear the expense of obtaining these sites, to carry out the Beeler recommendations. The Commission Council found, after many efforts were made to reach an amicable settlement of the matter, that expropriation methods would have to be used to compel the realty owners to be more reasonable in their demands. The new route will provide a wide thoroughfare from the upper to the lower section of the city.

**Disposes of Jamestown Buses.**—The Jamestown Street Railway, Jamestown, N. Y., recently announced that the company was selling six of its thirteen buses to Case & Kane, Middletown, N. Y. Five buses will be kept for use on the west side line in Jamestown and two more will be disposed of at once. A. N. Broadhead, president of the railway, recently withdrew an application for a blanket bus franchise in Jamestown after the City Council and railway officials had failed to agree on a rate of fare for the buses or an adjusted flat rate for both trolleys and buses.

**Freight Line to Be Electrified.**—The Long Island Railroad improvement plans, referred to in the ELECTRIC RAILWAY JOURNAL, issue of April 5, include the electrification of the freight line from Bay Ridge, Brooklyn, to Fresh Pond, where connection is made with the New York Connecting (Hell Gate route) Railroad. Over this route standard freight cars are interchanged daily between the Pennsylvania and New Haven Railroads. At present steam locomotives handle this traffic.

**Fare Tariffs Suspended.**—The Public Service Commission, in an order recently issued, suspended the proposed new tariffs filed by the Southern Pacific Railway for its Salem and Eugene railway lines, providing for an increase in fares from 6 to 7 cents. The suspension order will remain in effect until Sept. 22, unless investigations of the proposed tariff are completed before that time. Under the tariff filed by the Salem property conductors would be allowed to sell strips of four tickets for 25 cents and tickets in books of fifty could be purchased at $3.10. The present price of the fifty-ticket book is $3. The proposed Eugene schedule is practically the same as that of Salem.

**Maine Road Asks Fare Increase.**—The Androscoggin Electric Company Lewiston, Me., has filed a petition with the Public Utilities Commission asking for an increase in its through rate of fare from Portland to Lewiston from 93 cents to $1. The petition asks that the new rate become effective May 14.

**Advertisements to Tell the Public.**—In furtherance of its plan to solve the traffic problem in the downtown sections of Milwaukee and to awaken public opinion to the need of maintaining open spaces for the loading and unloading of buses in each block of the congested district, the Milwaukee Electric Railway & Light Company and subsidiary, the Wisconsin Motor Bus Lines, are running a series of advertisements in the current Milwaukee daily papers. One advertisement, called "Test of Special Bus Loading Zones Is Working Well," promised a report on various experiments which are being tried out in many cities to bring about traffic relief. Another advertisement described what was being done by traffic experts and other city planners in helping to solve the problem at least cost to the taxpayers. A third advertisement described the parking rules in effect in St. Louis, Detroit and San Francisco and another told what the Milwaukee Safety Commission was doing in this matter for the benefit of all concerned. Incidentally, another purpose of the ads. is to help the movement looking toward procuring a solution of the parking problem.

**Complains of Bus Grants.**—The Cincinnati Traction Company, Cincinnati, Ohio, has appealed to the State Public Utilities Commission for relief from bus competition in its territory. It filed protests against the granting of certificates to the Valley Bus Company and the Anderson's Ferry Transit Line. Petitions also were filed asking for a rehearing of the cases in which the commission granted certificates to the Red Star Transportation Line and the Wilmington & Norwood Bus Company. Protests also were filed against the granting of the certificates on a rehearing. The traction company contends that it is furnishing adequate service over much of the territory covered or proposed to be covered by the bus companies and that the operation of buses would be detrimental to its service.

**Will Provide Bus Service.**—The Wisconsin Traction, Light, Heat & Power Company, Appleton, Wis., has obtained an option on the bus line operated by Krautkramer Brothers between Appleton and Kaukauna, paralleling the interurban line. The company plans to extend its bus service from Kaukauna to Sheboygan, connecting with the parlor car electric trains of the Milwaukee Northern Railway running to Milwaukee.

**Wants to Increase Rates.** — The Waterville, Fairfield & Oakland Railway, Waterville, Me., has petitioned the Public Utilities Commission to increase its zone fare from 7 to 8 cents, with an increase in its strip ticket fare from 70 cents to 80 cents and an increase in its commutation books of fifty coupons from $3.50 to $4. The rate of pupil's tickets in books of forty coupons is increased from $1.40 to $1.60. The proposed schedule would become effective May 12. An increase in the zone fare on this line from 5 to 7 cents was granted by the Public Utilities Commission in the fall of 1918.

**Seeks Permission to Increase Fares.**—The Honolulu Rapid Transit Company, Honolulu, Hawaii, has petitioned the Territorial Public Utilities Commission for permission to increase fares in Honolulu from 5 cents to 6¼ cents, or four tokens for 25 cents. The report of operations of the company for 1923 was reviewed in the issue of the ELECTRIC RAILWAY JOURNAL for April 19, page 636.

**Bus Permitted Provisionally.** — The Public Service Commission recently granted a permit to operate buses between Tonawanda and the plant of the Dunlop Tire & Rubber Co., Inc., but provision is made for the cancellation of the franchise in the event that the International Railway, Buffalo, extends its River Road line to serve the Dunlop plant. Mr. Wooley had two buses in operation on River Road in 1920 until he was stopped by the commission after the International secured an injunction restraining him from further operation of the route in competition with its railway.

# Financial and Corporate

## Delaware & Hudson Reports

### Electric Lines Under the Albany System Show Both Increase and Decrease in Operating Revenues

The report of the Delaware & Hudson Company, Albany, N. Y., for the year ended Dec. 31, 1923, contains summaries of the earnings of the company's allied electric railway lines, including the United Traction Company, Hudson Valley Railway, Plattsburgh Traction Company and the Troy & New England Railway.

#### Details of Albany Operation

Operating revenues of the United Traction Company from all sources during 1923 were $3,234,149, operating expenses $2,839,937 and taxes $244,500. Operating income was $149,712, compared with $273,366 in 1922, a decrease of $123,654. Operating revenues increased $148,858, or 5 per cent over the preceding year; operating expenses increased $261,712, or 10 per cent, and taxes increased $10,800, or 5 per cent.

Of the gain in operating revenues, $75,521 was principally due to an increase of 1,033,000 in passengers carried and $74,894 to power sold to other companies. Operating revenues would have been greater except for losses of approximately $51,000 from the strike on the Schenectady Railway and $10,000 from a strike of short duration, in June, 1923, on the lines of the company.

Among the increases in items of operating expenses are: Paving, $102,500; removal of snow and ice, $24,000; equipment retired, $74,146; power purchased, $102,500; increased wages, effective June 1, 1923, $84,000; injuries and damages, $33,000, and these are partly offset by the following decreases: Track and roadway labor, $23,000; track and roadway material, $18,000; maintenance of structures, $21,000; miscellaneous equipment expenses, $5,000; maintenance of plant, buildings and equipment, $13,000; power plant supplies, $5,000; superintendence of transportation, $4,500; miscellaneous transportation expenses, $40,000; general office expenses, $26,000.

#### Paving Proves Expensive

Extensive street paving programs of the municipalities in which the electric railway lines are located forced premature reconstruction of tracks by the company at a cost of $347,208, involving charges to operating expenses of $134,694. The company's proportion of the cost of new pavement laid in 1923 approximated $204,578, of which $50,203 was charged to operating expenses and the balance to capital account. More than $1,000,000 has been spent in paving and repairing Capitol District streets and highways within the last ten years. The company regards the paving charges as needlessly burdensome.

Operating revenues of the Hudson Valley Railway during 1923 were $961,108, operating expenses $878,282, and taxes $67,000. Operating income for the year was $15,826, compared with $82,339 in 1922, a decrease of $66,513. Operating revenues decreased $62,511, or 6 per cent from the preceding year; operating expenses decreased $3,877, or less than 1 per cent, and taxes increased $7,879, or 13 per cent. Extensive use of privately owned automobiles is assigned as the principal factor in the decrease in operating revenues. One-man car operation was established on all lines in Glens Falls and on the interurban lines between Glens Falls, Hudson Falls and Fort Edward. In 1923 the municipality of Glens Falls engaged in a street paving program. The cost of its part of this work to the company was $41,515, of which $6,650 was charged to operating expenses and $34,865 to capital.

Operating revenues of the Plattsburgh Traction Company were $33,244, operating expenses $31,039, and taxes $2,107. Operating income for the year was $98, compared with $1,492 in 1922, a decrease of $1,394. Operating revenues decreased $2,728, or 8 per cent from the preceding year; operating expenses decreased $1,595, or 5 per cent, and taxes went up $262, or 14 per cent.

Operating revenues of the Troy & New England Railway were $30,073, operating expenses $20,990 and taxes $2,001. Operating income for the year was $7,082, compared with $534 in 1922, an increase of $6,548. Operating revenues increased $4,848, or 19 per cent over the preceding year; operating expenses decreased $2,113, or 9 per cent, and taxes increased $412, or 26 per cent.

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## $3,000,000 Equipment Issue at Pittsburgh

A total of $3,000,000 of Pittsburgh Railways 6 per cent car trust gold bonds was offered for subscription on April 24 by the Union Trust Company, Pittsburgh. The bonds mature serially, $200,000 on Feb. 1, 1925; $200,000 on Feb. 1, 1926, and $200,000 Feb. 1, 1927 to 1939, inclusive, the offering prices being respectively 100.50 yielding 5.22 per cent, 100.75 yielding about 5.50 per cent and 100 yielding 6 per cent.

It is explained that the car trust bonds are to be issued in part payment for sixty single-end, center-entrance, semi-convertible, double-truck, semi-steel passenger cars; 160 semi-steel passenger cars of the multiple-unit type, and sixty-five semi-steel passenger cars of the one-man, two-man type. The cost of this new equipment is estimated at $3,600,000.

The statement of the offering house reviews the new operating agreement with the city and says that this arrangement practically assures adequate revenues. The balance after the payment of fixed charges, including rents of leased properties, is reported at $670,276 for 1921, $555,509 for 1922 and $1,128,750 for 1923.

## $3,200,000 Grand Rapids Issue Offered at 7 per Cent Yield

Dillon, Read & Company, Federal Securities Corporation and Spencer Trask & Company, New York, offered for subscription on April 23 $3,200,000 of first mortgage 7 per cent sinking fund gold bonds dated May 1, 1924, and due May 1, 1939. The price was 99½ and interest, to yield slightly more than 7 per cent. The bonds are in the denomination of $1,000 and $500. The proceeds of the sale of the bonds are to be used in refunding bonded debt of the company due June 1, 1924.

The Grand Rapids Railway owns and operates the entire electric railway system in the city of Grand Rapids, serving a population of more than 145,000. It is explained that the bonds are to be secured by a direct first mortgage lien on 69 miles of railway and 193 cars now owned by the company, and on all its tracks, equipment, real estate and other physical property, together with power contracts and franchises.

The bankers point out that the City Commission of Grand Rapids has placed a valuation of $5,500,000 on the properties for purposes of rate making, as of Jan. 1, 1922, and that with additions to property since that date, the rate making base now amounts to more than $5,800,000. Net income after taxes, available for interest and depreciation reserves for the year ended Dec. 31, 1923, was $560,457. This amount is two-and-a-half times the annual interest charge of $224,000 on the $3,200,000 new first mortgage 7 per cent bonds. A sinking fund of 2½ per cent per annum payable semi-annually will be used to retire bonds by purchase up to the current redemption prices or, if not so obtainable, by call at those prices.

The gross earnings of the company in 1916 were $1,297,586. That year bond interest was $143,012. In 1923 the gross earnings were $1,817,606. That year bond interest was $220,000. The net earnings available for interest and depreciation increased from $469,561 in 1916 to $560,457 in 1923.

## Approves Security Issues in Birmingham Reorganization

Transfer of all properties of the Birmingham Railway, Light & Power Company, Birmingham, Ala., and of the Tidewater line to the newly organized Birmingham Electric Company was approved by the Alabama Public Service Commission and formal orders were issued following a hearing in Montgomery on April 16. Authority was also granted to the Birmingham Electric Company to issue $8,000,000 of refunding mortgage gold bonds bearing 6 per cent interest and maturing in 1954, 19,990 shares of no par value cumulative preferred stock and 799,990 shares of no par value common stock.

The railway properties to be transferred include the Norwood Street Railway and the Edgewood Street Railway, in addition to the Birmingham Railway, Light & Power and Tidewater lines. The petitions were amended at the hearing to include the Tidewater lines and the other properties.

## Initial Dividend on B.-M.T. Preferred Stock

The directors of the Brooklyn-Manhattan Transit Corporation on April 21 declared an initial dividend of $1.50 a share on preferred stock for the quarter ended March 31, 1924, payable on May 15 to stockholders of record on May 1. The dividends on this stock do not become cumulative until July 1, 1926.

Gerhard M. Dahl, chairman of the executive committee, says that this dividend is to be considered in the nature of interest on money contributed by stockholders at the time of the reorganization, nine months ago, and is not to be taken as an indication that the company is earning a fair return on its actual investment or on a fair valuation of its property.

Mr. Dahl declared that the city by reason of its failure to build subways called for by the dual subway contracts was responsible for the present overcrowding of the rapid transit lines and had handicapped the company seriously. He asserted that the city had also defaulted in its obligation to supply the company with yards and shops and added that it was the policy of the present management of the company to give the best service possible under existing conditions.

Mr. Dahl said in part:

> Before the directors, however, had taken any action in recognition of their obligation to the preferred stockholders, they did everything within their present power to provide adequate transit facilities for the public. Since the organization last June, for example, the directors have appropriated approximately $4,000,000 for new cars and equipment for rapid transit lines alone, despite the fact that the net income from the operation of the rapid transit lines would not justify so large an investment in improvements. Furthermore, on its surface lines this company is continuously making changes and adding improvements which seek to better the service.
>
> The B.-M. T. is ready now, as it has been at all times in the past, to increase its rapid transit service and to decrease the necessity for the present dangerous and unhealthful congestion but it is powerless to do anything more so long as the city of New York defaults under its contract with this company and refuses to carry out contract No. 4. which provides for the completion of the Fourteenth Street eastern line, the Nassau-Broad Street extension and the construction of new shops and yards.
>
> The city and the company together have invested in our rapid transit lines the sum of $295,000,000. On this amount for the first nine months of operations the earnings were 2.4 per cent.
>
> For eleven years taxpayers and investors have combined to pour money into rapid transit lines and equipment, and this huge investment is earning less than 3 per cent without allowing any return on the $60,000,000 worth of elevated lines.

## Kansas Lines Participate in Terminal Line Purchase

The Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan., has been authorized to acquire control of the Kansas & Missouri Railway & Terminal Company through the purchase of 8,000 shares of stock without nominal or par value, issued or to be issued by the Terminal company under authority granted by the Interstate Commerce Commission's order of Feb. 16, 1924.

The commission dismissed that part of the application of the Kansas City, Kaw Valley & Western seeking to acquire first mortgage bonds of the Terminal company and the application of the Kansas City Southern to acquire one-half of said bonds, the principal amount of which is $379,000.

The Kaw Valley operates an electric passenger and freight road between Kansas City and Lawrence, Kan., and connects at Kansas City with a line formerly owned by the Kansas City, Outer Belt & Electric Railway, and through an arrangement with the receiver of the Outer Belt Road, the Kaw Valley is able to interchange freight with other carriers, including the Kansas City Southern. The Outer Belt also owns a partly constructed line, extending from a connection with the Kaw Valley to a point near the mouth of the Kansas River, which line the Terminal company was instructed to complete and operate, together with the lines formerly owned by the Outer Belt. The lines of the Terminal company will be operated by electricity, with some of the equipment, power and employees of the Kaw Valley.

The cost of the Terminal company's securities to the Kaw Valley and the Kansas City Southern, which participated in the purchase, is $388,636. The cost of rehabilitation and construction of the Terminal company's lines is placed at $421,000, or a total estimated cost of the lines when completed of $809,636.

## Largest Balance for Dividends in Holding Company

Standard Gas & Electric Company, Chicago, reports for 1923 the largest balance available for dividends in the history of the company. The payment of dividends on the common stock at the rate of $2.50 per share per annum was started for the quarter beginning April 1, 1923. Common dividends were increased to the rate of $3 per share per annum for the quarter beginning Jan. 1, 1924.

Net revenue of the company for 1923 was $5,103,425, compared with $4,652,126 in 1922. The company includes in its earnings only amounts actually received or in process of collection. The balance before preferred dividends in 1923 was $2,940,829 compared with $2,811,422 in 1922.

Gross earnings of the operated public utility companies for 1923 were $46,165,533 and net earnings were $18,711,033. These figures represent an increase in gross earnings of 9.72 per cent and an increase in net earnings of 16.4 per cent over 1922.

The interests of the stockholders have been substantially improved, according to President H. M. Byllesby, by certain changes in the capital structure, authorized at a special meeting of the stockholders on March 19, 1924, at which the recommendations of the directors for an authorized issue of 7 per cent cumulative prior preference shares and 6 per cent non-cumulative stock were approved. This action enables changes in the outstanding capitalization which, together with the conversion of debentures into common stock, will result in reducing the proportion of funded debt to the total capitalization. Upon completion of this financing the company will have no secured funded debt.

The construction budgets for 1924 are estimated at $32,672,000, representing additions and extensions. New construction in 1923 required an expenditure of $31,471,106.

The Standard Gas & Electric Company operates the electric railways in Fargo, N. D., and Fort Smith, Ark. During the year it took over the Wisconsin-Minnesota Light & Power Company, operating about 25 miles of city and interurban railway.

## Conspectus of Indexes for April, 1924

Compiled for Publication in this Paper by
**Albert S. Richey**
**Electric Railway Engineer**
**Worcester, Mass.**

| | Latest | Month Ago | Year Ago | Since War | |
|---|---|---|---|---|---|
| | | | | High | Low |
| **Street Railway Fares*** 1913 = 4.84 | Apr.<br>1924<br>**6.94** | Mar.<br>1924<br>**6.93** | Apr.<br>1923<br>**6.89** | May<br>1921<br>**7.24** | May<br>1923<br>**6.88** |
| **Street Railway Materials*** 1913 = 100 | Mar.<br>1924<br>**164** | Feb.<br>1924<br>**163** | Mar.<br>1923<br>**174** | Sept.<br>1920<br>**247** | Sept.<br>1921<br>**156** |
| **Street Railway Wages*** 1913 = 100 | Apr.<br>1924<br>**219** | Mar.<br>1924<br>**219** | Apr.<br>1923<br>**207** | Sept.<br>1920<br>**232** | Apr.<br>1923<br>**207** |
| Steel—Unfilled Orders (Million Tons) 1913 = 5.91 | Mar. 31<br>1924<br>**4.78** | Feb. 29<br>1924<br>**4.91** | Mar. 31<br>1923<br>**7.40** | July 31<br>1920<br>**11.12** | Feb. 28<br>1922<br>**4.14** |
| **U.S. Bank Clearings Outside N. Y. City (Billions)** | Mar.<br>1924<br>**15.12** | Feb.<br>1924<br>**14.71** | Mar.<br>1923<br>**16.36** | Mar.<br>1920<br>**18.54** | Feb.<br>1922<br>**10.65** |
| **Business Failures** | Mar.<br>1924 | Feb<br>1924 | Mar.<br>1923 | Jan.<br>1924 | Sept.<br>1923 |
| **Number** | **1,652** | **1,578** | **1,677** | **2,258** | **1,280** |
| **Liabilities (millions)** | **61.33** | **73.75** | **60.62** | **109.1** | **27.50** |

| | Latest | Month Ago | Year Ago | Since War | |
|---|---|---|---|---|---|
| | | | | High | Low |
| **Eng. News-Record Construction costs** 1913 = 100 | Apr.<br>1924<br>**221.6** | Mar<br>1924<br>**221.7** | Apr.<br>1923<br>**213.5** | June<br>1920<br>**273.8** | Mar.<br>1922<br>**162.0** |
| **U.S. Bur. Lab. Stat.** Wholesale Commodities 1913 = 100 | Mar.<br>1924<br>**150** | Feb.<br>1924<br>**152** | Mar.<br>1923<br>**159** | May<br>1920<br>**247** | Jan.<br>1922<br>**138** |
| **Bradstreet's** Wholesale Commodities 1913=9.21 | Apr. 1<br>1924<br>**12.66** | Mar. 1<br>1924<br>**12.90** | Apr. 1<br>1923<br>**13.93** | Feb. 1<br>1920<br>**20.87** | June 1<br>1921<br>**10.62** |
| Dun's Wholesale Commodities 1913 = 120.9 | Apr. 1<br>1924<br>**186.8** | Mar. 1<br>1924<br>**190.7** | Apr. 1<br>1923<br>**193.1** | May 1<br>1920<br>**263.3** | July 1<br>1921<br>**159.8** |
| **U.S. Bur. Lab. Stat. Retail food** 1913 = 100 | Mar.<br>1924<br>**144** | Feb<br>1924<br>**147** | Mar.<br>1923<br>**142** | June<br>1920<br>**219** | Mar.<br>1922<br>**139** |
| **Nat. Ind. Conf. Bd. Cost of living** 1914 = 100 | Mar.<br>1924<br>**163.2** | Feb.<br>1924<br>**163.9** | Mar.<br>1923<br>**159.2** | July<br>1920<br>**204.5** | Aug.<br>1922<br>**154.5** |

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population.

Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen and conductors on 105 street and interurban railways in the United States, operating more than 100 passenger cars each, and weighted according to number of cars.

**Power Rights Acquired.**—Thomas S. Wheelwright, president, has announced the purchase by the Virginia Railway & Power Company of the property of the Roanoke Rapids Power Company, Roanoke Rapids, N. C., owner of valuable water rights, some of them undeveloped, north of Weldon, N. C. Instead of adding to its steam power equipment the Virginia Railway & Power Company plans to build a high-tension line connecting with the Virginia cities.

**Interurban Involved in Purchase.**—An option on the controlling interest in the common stock of the Toledo & Indiana Traction Company, Toledo, has been taken by the Lake Shore Power Company, a new holding corporation, organized here with Charles T. DeHore of the General Electric Company as president and L. V. Van Ness, president of the Maumee Valley Lines, and other local capitalists associated with them. The Toledo & Indiana operates from Toledo west to Bryan, a distance of about 50 miles. It has $1,040,000 of common stock and $400,000 of bonds outstanding. The railway does a power and lighting business.

**Net Earnings of Porto Rico Company Lower.**—Net earnings of the Porto Rico Railways, Ltd., Ponce, Porto Rico, for 1923 were $433,353, compared with $516,638 for 1922, due to heavier operating expenses. Disbursements included $119,020 interest on first mortgage bonds, $64,483 interest on refunding mortgage bonds, $70,000 dividend on preferred stock, $100,000 reserve for depreciation. Including balance of $557,405 at credit of profit and loss, there was carried forward $651,221. Current assets decreased from $503,081 to $453,627, and current liabilities from $355,625 to $242,183, an improvement of $63,987 in liquid position.

**Hearing Set in Reorganization Contest.**—Action in a contest to set aside the reorganization of the San Francisco-Oakland Terminal Railways, Oakland, Cal., as the Key System Transit Company, was taken on April 15 when Superior Judge John D. Murphey set April 25 as the date for hearing of several motions and demurrers to the suit brought against the company by Frederick Olschweski. One of the charges is that the committee in charge of the reorganization conspired to wipe out the interest in the company which were represented by the ownership evidenced in the issue of common stock outstanding.

**Confirmation of Sale Before Judge.**—The sale of the Electric Short Line, which runs westward from Minneapolis, Minn., by the mastery in chancery for $275,000 has been placed before Judge W. F. Booth of the Federal court for confirmation. The line was sold at public auction by Master Howard S. Abbott to the bondholders represented by W. H. Thorp, chairman of the reorganization committee. The line has cost more than $2,000,000 and prospective extensions have not yet been completed. A foreclosure decree was entered in January. Willard J. Hield and Erle D. Luce are receivers for the property. The purpose in reorganization has been to reduce the bonded indebtedness to such a ratio to assets as to make it possible for the Interstate Commerce Commission to give authority for a bond issue to finance extension of the line of the company, to points west of Lake Lillian, the present terminus.

**Cannot Delay Tax Payments.**—The United States Court of Appeals at St. Louis reaffirmed its former ruling that the Denver Tramway, Denver, Colo., now in receiver's hands, cannot list taxes owed to the city of Denver as "an ordinary debt to take its turn with other debts." The company owes the city $220,000. It ceased paying right after the 1920 strike.

**Suburban Railway Discontinued.**—In his annual report to the shareholders of the Dominion Power & Transmission Company, Hamilton, Ont., President J. R. Moodie states that with the exception of the railway department a steady advance was enjoyed in 1923. During the year just ended the board decided that it was necessary to discontinue operating the Hamilton & Dundas Railway and on Sept. 5, 1923, this decision became effective. Nothing is known yet as to the disposition of the property. The statement says that bonds to the amount of $231,000 have been redeemed. According to the report the total of the reserves and profit and loss accounts have been increased by the sum of $283,559, bringing this total to the amount of $3,900,021.

**Equipment Trust Certificates Offered.**—Mention is made in an offering of $17,640,000 of Southern Pacific Company 5 per cent equipment trust certificates, Series G, of the fact that five electric locomotives, fifty steel center-entrance electric street cars, twelve steel one-man, two-man electric street cars, and six steel electric motor coaches are included in the equipment covered by the deed of trust. The offering was made by Kuhn, Loeb & Company, New York, on April 24. The certificates are being offered at 99½ and accrued dividends to yield an average of 5.08 per cent. They mature in equal annual instalments from May 1, 1925 to May 1, 1939 both inclusive. There is vested in the trustee title to equipment costing not less than $22,050,000.

**Railway Service to End.**—After a controversy of many weeks the Chicago, Burlington & Quincy Railroad, Deadwood, S. D., has given notice that trolley service between Deadwood and Lead will be discontinued and that a bus line will be substituted to operate between the two cities, which are about 4 miles apart. David Keffeler, Lead, S. D., will run the bus line between the two cities for a period of three years, which is the unexpired term of the franchise with the city.

**South Carolina Company Reported Under Option.**—Stone & Webster, Inc., Boston, are reported to have an option on the Columbia Railway, Gas & Electric Company and associated utility properties in and near Columbia, S. C., with a view to possible purchase of these properties and the development of additional power for central South Carolina. It is further said that a proposition has been made to the Columbia Canal Commission to pay the state $200,000 for settlement of the pending litigation over proposed completion of the canal. The offer is said to have been made by George J. Baldwin, Savannah, Southern associate of Stone & Webster and Benet, Shand & McGowan, Columbia, and T. Frank Watkins, Anderson, counsel for the company.

**Seeks Line Discontinuance.**—The Illinois Power & Light Corporation, Chicago, Ill., has applied to the Illinois Commerce Commission for permission to discontinue service on its line between Galesburg and Knoxville in Knox County.

**Service Suspended.**—The York Utilities Company, Sanford, Me., recently suspended service between Kennebunk and Wells. This suspension was in accordance with the announcement made a few weeks ago by the company. So far as is known no efforts are being made to resume service.

**Purchase of Long Island Branch Recommended.**—The New York Transit Commission has revived negotiations for the purchase for the city of the Whitestone division of the Long Island Railroad from Whitestone Landing to Flushing, L. I. The commission proposes to make the line an integral part of the city's rapid transit system, connecting it with the extension of the Corona elevated-subway line at Flushing. Vice-President LeBoutillier, acting head of the Long Island Railroad, is said to look with favor upon the proposal if suitable terms can be arranged. The city's Corona line now is nearing completion into Flushing. The extension would be connected physically with the Whitestone line, forming continuous trackage to the Borough of Manhattan.

**J. C. Easley New Director at Richmond.**—John C. Easley Richmond, was the only new director elected on April 16 at the annual meeting of the Virginia Railway & Power Company Richmond. He replaced P. M. Chandler, Philadelphia, resigned.

**Merger of Subsidiaries Approved.**—The Wisconsin Railroad Commission has approved the merger of six Wisconsin electric companies into the Eastern Wisconsin Electric Company, operating both city and interurban railways. The Eastern Wisconsin Company has controlled the six companies and in the petition to the Railroad Commission asking permission to merge the company declared that it was seeking more economical and uniform operation of all the companies and with the merging it would be in a position to improve service and carry out financing through one corporation instead of seven. The companies merged with the Eastern Wisconsin are the Wisconsin Light, Heat & Power Company, Madison; Janesville Electric Company, Mineral Point Electric Company, Badger Electric Company, Wisconsin Utilities Company and Middle Wisconsin Power Company. The Railroad Commission has authorized the Eastern Wisconsin Company to issue $2,115,900 of bonds for the purpose of retiring bonds of the companies taken over.

# Personal Items

## R. E. Danforth Consultant

### Former New Jersey Official, After Complete Rest, Will Engage in Traction Work as Expert

Richard E. Danforth, who on April 1, 1924, retired from the vice-presidency and the general managership of the Public Service Railway, Newark, N. J., will retain a permanent consulting relation with the Public Service. He will make his headquarters for the present at Skaneateles, N. Y., but will visit Newark as may be necessary in the interests of the railway. Mr. Danforth has actually been away from his office for five months and does not intend to engage in any work for the remainder of the year other than such service as he may be called upon to perform for the Public Service. At the end of that time, however, he plans to establish himself as consultant, not only for the Public Service, but for banking and bond houses, and for other railways.

For this work Mr. Danforth has had remarkable experience as railway manager, engineer, and consultant, covering thirty-two years. After he was graduated from Cornell University in 1891, Mr. Danforth was for a year an apprentice with the Buffalo Railway; then for five years superintendent of the Buffalo, Bellevue & Lancaster Railway. With this preparation he became superintendent and purchasing agent of the Buffalo Railway, remaining as superintendent of the Buffalo lines of the International Railway after the formation of that company in 1899. In 1901 he designed the railway terminal for the Pan-American Exposition, a kind of work which he especially enjoyed. He left in that year, however, to become general manager of the Lake Shore Electric Railway. This property was handicapped by lack of funds and when it went into receivership, early in 1902, Mr. Danforth went to Rochester, N. Y., where he spent five years, first as assistant general manager, then as vice-president and general manager of the Rochester Railway.

### SEVENTEEN YEARS SERVICE IN NEW JERSEY

Beginning in 1907 he was for exactly seventeen years general manager of the Public Service Railway, and for a considerable part of this period vice-president as well. As manager in New Jersey he succeeded Albert H. Stanley, now Lord Ashfield, who on April 1, 1907, sailed to assume the management of the Underground Railways of London. The Public Service property is enormous, but neither this nor the intricacy of the detail problems which were presented daunted Mr. Danforth. It is obvious that behind the remarkable career of the man there must be a strong personality. There is. Slight of frame, Mr. Danforth is characterized by keenness of mind, alertness of manner and great driving power. A strict disciplinarian, he has always tempered discipline with the kindliest of dispositions. One of his greatest satisfactions has been the affection with which his associates, including the rank and file of his employees, have regarded him. He has always been an approachable chief, and has been quick to give to department heads credit for their share in the results achieved by his department. His well known interest in vocational education is a natural corollary to his interest in men.

Mr. Danforth has always insisted on the best of accounting practice, stores accounting and operating detail records, and has been quick to avail himself of such records as a means to economical operation. These records were of great value to him in the activities of the past few years. He spent the better part of 1918 to 1922, inclusive, as an expert before courts and the Public Utility Commission or in the preparation for this work and in assisting attorneys in cross-examining opposing witnesses. At the same time he kept a close rein on the affairs of the Public Service Railway, carefully watching revenues and expenses. A tribute to his work in this connection is the reports of appraisers of the property who found it in 100 per cent operating condition in 1916, 1919 and 1921-22, in spite of strenuous cuts in the expenses made necessary by rising costs and limited rate of fare.

In accepting Mr. Danforth's resignation, President McCarter and the other directors of the Public Service expressed appreciation of the value of his efforts to keep the property safe and intact during the trying years of the war, and the almost equally trying years that have followed during the period of readjustment.

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## Dr. Ambrose Swasey Awarded John Fritz Medal

Dr. Ambrose Swasey, Cleveland, inventor, manufacturer, philanthropist and dean of the American engineering profession, has been presented with the John Fritz gold medal, one of the highest distinctions in world engineering. The ceremonies took place on the evening of April 23 in the Engineering Societies Building, New York, in the presence of distinguished engineers, scientists and educators from all over the country.

The award was made in recognition of Dr. Swasey's achievements "as a designer and manufacturer of instruments and machines of precision, a builder of great telescopes, a benefactor of education and the founder of Engineering Foundation."

The medal was originally established by these four national engineering societies in honor of a great American metallurgical engineer, John Fritz of Bethlehem, Pa. It has since become an international institution, and is now regarded as the highest engineering honor in America. This is the first time in four years that the medal has been awarded to an American.

**J. W. Delaney** has been appointed assistant to the master mechanic of the Market Street Railway, San Francisco, Cal. The master mechanic is J. M. Yount.

**Frank P. Flinn** has become master mechanic of the Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute division. The new appointee will relieve M. M. Nash, superintendent of the city lines, of all duties in connection with the maintenance of car equipment, giving him the opportunity of devoting all of his time to the traffic department. Mr. Flinn has been superintendent of the American Car & Foundry Company plant at Terre Haute for some time. Previous to coming to Terre Haute he was connected with the Westinghouse Machine Company and the Heyl & Patterson Engineering Company of Pittsburgh, Pa.

**J. R. Abercrombie**, secretary-treasurer of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., has been made secretary-treasurer of the Capital Gas & Electric Company, Topeka, Kan., formerly known as the Consumers Light, Heat & Power Company. Mr. Abercrombie was associated with the St. Joseph property for twenty-two years.

**Eugene E. Stringer**, who has been connected with the La Crosse, Wis., office of the Northern States Power Company as commercial manager, has been appointed acting manager of the company at Chippewa Falls to assume the duties of Albert Smith, formerly in charge of the electric railway, electric and gas departments.

**Oscar B. Smith** of Knox, Ind., has been appointed by Gov. Warren T. McCray of Indiana as a member of the Indiana Public Service Commission to succeed Oscar Ratts of Paoli. The appointment is effective May 1, with the expiration of the term of Mr. Ratts. Mr. Smith is one of the leading attorneys of northern Indiana. He is a former member of the State Senate, where he represented his own and another county. He has been Republican chairman of his county for six years.

**N. S. Cumming**, superintendent of the Niagara, St. Catharines & Toronto Railway, St. Catharines, Ont., has been transferred to Toronto to superintend the Toronto Suburban Railway. He became superintendent of the St. Catharines property more than four years ago, succeeding W. R. Robertson, who resigned to accept a position with the Ontario Hydro-Electric Power Commission. Mr. Cumming before this appointment was chief clerk of the railway department of the Dominion Power & Transmission Company, in Hamilton. A farewell to him was attended by his many employee friends in the railway business, who presented to him a gold watch and chain. In commenting on Mr. Cumming's success as a railroad operator, E. W. Oliver, general manager of the Canadian National Electric Lines, stressed the many difficulties which Mr. Cumming had surmounted while in charge of the property. He said that he had arranged for his transfer so that the Toronto Suburban Railway might have the benefit of his services.

# Obituary

## Arthur Warren

Arthur Warren, representative of the committee on public relations on the memorable tour of the country taken by members of the executive committee of the American Electric Railway Association in 1912, died in Bermuda on April 16. As it turned out, Mr. Warren and the members of that committee became the precursors of the more modern movement to place the case for the electric railways directly before the public. For the part that he took in this work Mr. Warren was particularly well qualified. He was London correspondent of the Boston *Herald* from 1887 to 1897, editorial and special writer for the same paper from 1897 to 1907, associate editor from 1907 to 1909 and dramatic critic of the New York *Tribune* from 1909 to 1912. He was also for many years associated in a confidential capacity with George Westinghouse, and had a great deal to do with formulating the publicity policy of the Westinghouse company in the early days. Mr. Warren was born in 1860, and besides his journalistic work was the author of a book, entitled "London Days," in which he described his British impressions.

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**Col. Robert Kirkup**, ninety-two years old, pioneer brass foundryman and president of Robert Kirkup & Company, Cincinnati, one of the oldest manufacturers of brass castings in the Middle West, died at his home in Avondale, a suburb of Cincinnati, on April 12. Mr. Kirkup's death was due to injuries and shock suffered when he fell down stairs in his brass foundry in February. Mr. Kirkup was colonel of the Fifth Ohio Volunteer Infantry during the Civil War. He was born in Scotland and came to this country when he was twenty-eight years old.

**Arthur Field**, sales manager of the Standard Motor Truck Company, Pittsburgh, Pa., is dead.

**Miss Sarah R. Harvey**, auditor for the Trenton & Mercer County Traction Corporation, Trenton, N. J., died on April 18. Miss Harvey had been connected with the company for thirty years. She was a member of the Professional and Business Women's Club and the First Presbyterian Church, Trenton.

**George W. McNulty**, a builder of subways and conduit street railways, died recently in New York City at the age of seventy-three years. He was a civil engineer of note. After assisting in the construction of the Brooklyn Bridge he went into business for himself as a contractor. Then he became chief engineer of the Metropolitan Street Railway in New York and supervised the installation of the cable system on Broadway. Later he helped to build the subway from Times Square to Columbus Circle and was engineer for the Sunnyside Yard for the Pennsylvania Railroad. Still later he served with the Holbrook contracting firm in the building of many sections of the New York subways. He was one of the oldest members of the Engineers' Club.

# Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

## Code of Business Ethics Formulated

### Principles that Will Avert Restrictions Set Forth by U. S. Chamber of Commerce

A committee of the Chamber of Commerce of the United States has worked out a code of business ethics based on the "material needs of mankind" and the necessity of "increasing the wealth of the world and the value of happiness of life." The code will be submitted to the convention of the chamber at Cleveland on May 6. It follows:

> The foundation of business is confidence, which springs from integrity, fair dealing, efficient service and mutual benefit.
>
> The reward of business for service rendered is a fair profit plus a safe reserve, commensurate with risks involved and foresight exercised.
>
> Equitable consideration is due in business alike to capital, management, employees and the public.
>
> Knowledge—thorough and specific—and unceasing study of the facts and forces affecting a business enterprise are essential to a lasting individual success and to efficient service to the public.
>
> Permanency and continuity of service are basic aims of business, that knowledge gained may be fully utilized, confidence established and efficiency increased.
>
> Obligations to itself and society prompt business unceasingly to strive toward continuity of operation, bettering conditions of employment and increasing the efficiency and opportunities of individual employees.
>
> Contracts and undertakings, written or oral, are to be performed in letter and in spirit. Changed conditions do not justify their cancellation without mutual consent.
>
> Representation of goods and services should be truthfully made and unscrupulously fulfilled.
>
> Waste in any form—of capital, labor, services, materials or natural resources—is intolerable, and constant effort will be made toward its elimination.
>
> Excesses of every nature—the inflation of credit, overexpansion, overbuying, overstimulation of sales—which create artificial conditions and produce crises and depressions are condemned.
>
> Unfair competition, embracing all acts characterized by bad faith, deception, fraud or oppression, including commercial bribery, is wasteful, despicable and a public wrong. Business will rely for its success on the excellence of its own service.
>
> Controversy will, where possible, be adjusted by voluntary agreement or impartial arbitration.
>
> Corporate forms do not absolve or alter the moral obligations of individuals. Responsibilities will be as courageously and conscientiously discharged by those acting in representative capacities as when acting for themselves.
>
> Lawful co-operation among business men and useful business organizations in support of these principles of business conduct are commended.
>
> Business should render restrictive legislation unnecessary through so conducting itself as to deserve and inspire public confidence.

The report was prepared by Judge Edwin B. Parker, umpire of the German-American Mixed Claims Commission of Washington; Paul W. Brown, editor of *America at Work*, St. Louis; William Butterworth, president of Deere & Company, Moline, Ill.; Henry S. Dennison, president of the Dennison Manufacturing Company, Framingham, Mass.; Noble Foster Hoggson, president of Hoggson Brothers, New York; James R. MacColl, president of the Lorraine Manufacturing Company, Pawtucket, R. I.; Henry T. Noyes, Rochester, N. Y., and George Rublee, Washington.

## Trade Association Activities

### Three Proposals to Define Right of Such Bodies Will Be Discussed at Commerce Meeting

Much still remains to be done to fix the exact status of the trade association with respect to its right to collect and disseminate information. Some precedents have been established and the correspondence of the National Lumber Manufacturers' Association, made public in February last, has helped the situation. In fact, one of the letters in the correspondence of that association was accepted as constituting the first public statement on behalf of a national association in interpretation of the requested informal opinion on the subject given to Secretary of Commerce Hoover by Attorney-General Daugherty. But that did not dispose of the situation. So in their own behalf members of the Chamber of Commerce of the United States have decided that trade associations and their activities shall go on the program for the Cleveland meeting, May 6 to 8.

In this connection three separate proposals concerning trade associations have been submitted by member organizations of the national chamber for consideration at the convention. Thus the Memphis Chamber of Commerce proposes that the national chamber should advocate creation of a commission which would define the rights of trade associations and their members in all respects, including their rights to discuss operating expense, sources of supplies for materials, prices, trade competition, etc. A study of anti-trust laws and of the Federal Trade Commission's powers and activities would be included. The purpose would be to establish recognized principles which would remove handicaps under which trade associations now operate, through fear that they may violate some law, rule or regulation and be called before a commission or the courts upon a criminal or civil charge the existence of which, regardless of the merits, is detrimental.

## New Quarters for Westinghouse Interests in New York

The Westinghouse Electric & Manufacturing Company has moved its New York executive offices from 165 Broadway to 150 Broadway. The new building is known as the Westinghouse, and all departments of the company will hereafter conduct business from there. The Westinghouse Electric International Company and the Westinghouse Lamp Company will move into the new building next week-end. The Westinghouse interests will utilize the upper twelve stories of the twenty-three-story structure, the total space amounting to approximately 100,000 sq.ft.

## New Metal for Car Building Promised

W. W. Atterbury, vice-president in charge of operation of the Pennsylvania Railroad, appeared before the Senate agricultural committee on April 19 in behalf of the Hooker-White-Atterbury offer for the government plant in opposition to that of Henry Ford. Mr. Atterbury promised the manufacture at Muscle Shoals of a new metal "that will revolutionize transportation." The scheme advocated by Mr. Atterbury looks to the manufacture of freight and passenger cars from a new metal that he discovered abroad during the war.

Mr. Atterbury said the new metal would be lighter than steel and almost as strong, and could be manufactured with waterpower much cheaper. He declared it could be used in the construction of both freight and passenger cars and he predicted that these would take the place gradually of those now in existence. Mr. Atterbury added that the new cars would cost less than those used today.

Almost at the same time that Mr. Atterbury was making his remarks discovery of a new alloy metal to take the place of steel in the near future was predicted by Dr. Arthur A. Hamerschlag, president of the Research Corporation. Dr. Hamerschlag said:

> We are on the threshold of an era of changes in the great field of metallurgy. Steel has ruled king of industry. Its position is being threatened by those who have been pioneering in the fields of the alloys. The inventor who can produce a new metal with the strength of steel, non-corrosive, lighter in weight, already is on the horizon.

## Metal, Coal and Material Prices

| Metals—New York | April 22, 1924 |
|---|---|
| Copper, electrolytic, cents per lb. | 13.437 |
| Copper wire base, cents per lb. | 15.875 |
| Lead, cents per lb. | 8.075 |
| Zinc, cents per lb. | 6.487 |
| Tin, Straits, cents per lb. | 49.625 |
| **Bituminous Coal, f.o.b. Mines** | |
| Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons | $4.20 |
| Somerset mine run, Boston, net tons | 2.175 |
| Pittsburgh mine run, Pittsburgh, net tons. | 1.875 |
| Franklin, Ill., screenings, Chicago, net tons | 2.175 |
| Central, Ill., screenings, Chicago, net tons. | 1.90 |
| Kansas screenings, Kansas City, net tons. | 2.50 |
| **Materials** | |
| Rubber-covered wire, N. Y., No. 14, per 1,000 ft. | $6.65 |
| Weatherproof wire base, N.Y., cents per lb. | 17.50 |
| Cement, Chicago net prices, without bags. | $2.20 |
| Linseed oil (5-bbl. lots) N. Y., per gal. | $0.93 |
| White lead, in oil (100-lb. keg), N. Y., cents per lb., carload lots | 12.25 |
| Turpentine, (bbl. lots), N. Y., per gal. | $0.99 |

### *Rolling Stock*

**Salamanca, Olean & Bradford Railway, Salamanca, N. Y.,** has applied to the Public Service Commission for permission to place a bond issue to finance the purchase of three one-man safety cars.

**Cincinnati, Georgetown & Portsmouth Railroad, Cincinnati, Ohio,** has asked the authority of the State Public Utilities Commission to issue $17,000 of equipment trust certificates for the purpose of purchasing two interurban cars.

**New Orleans Public Service, Inc., New Orleans, La.,** has contracted with the Perley Thomas Car Company, High Point, N. C., for fifty-five modern cars at an approximate cost of $700,000. The cars will be delivered this fall. The contract for the motor equipment and the air brakes was split between the Westinghouse Electric Company and the General Electric Company. The New Orleans property has also placed an order for four additional buses with the Yellow Coach Manufacturing Company, Chicago, Ill.

### *Track and Line*

**Madison Railways, Madison, Wis.,** will soon begin the double tracking of its line on University Avenue and Breeze Terrace.

**Savannah Electric & Power Company, Savannah, Ga.,** is replacing the old track around the city market with new 114-lb. rail. The job when completed will cost approximately $5,000, of which $1,500 will be for repaving between the track and 2 ft. on each side. More than $250,000 will be spent on improvements during 1924. To complete the 1923 construction program it will cost $41,863, while the new work for the year which has just been approved is estimated to cost $275,111.

**Trenton & Mercer County Traction Corporation, Trenton, N. J.,** will install steel ties in the Borough of Pennington.

**Tri-City Railway, Davenport, Iowa,** has completed approximately 4,000 ft. of new track. The proposed project consists of 2,675 ft. of double track and 1,300 ft. of single track. The company also reports progress on the Rockingham Road project, where new track is being laid preparatory to the paving of the street.

**North Carolina Public Service Company, Greensboro, N. C.,** is improving its track between Spencer and Salisbury by lowering the rails almost on a level with the surface of the street.

**Department of Street Railways, Detroit, Mich.,** will start track extensions on May 1, which will be carried to conclusion during the month of May. The extensions include laying of tracks on Livernois Avenue from Fenkell Avenue to Six Mile Road, as an extension of the Trumbull Avenue line. This has been referred to as the most important project recently announced. Three extensions are proposed for construction beginning May 1, and still another program of extensions and improvements of service is to be made public for June 1, it was announced. The East Warren line will be extended from St. Jean Avenue at least 1 mile farther east if the Department of Public Works proceeds with the grading and paving. Construction between Toledo Avenue and Michigan Avenue on the Scotten Avenue line will begin on May 1, and the Scotten line extended between Fort Street and Michigan Avenue. This line was commenced last year and construction work carried on between Fort Street and Toledo Avenue. When completed this will form a link in the loop for the Clairmount and Grand Belt cars.

**United Railways, St. Louis, Mo.,** has been granted a permit by the St. Louis Board of Public Service to lay some 3 miles of T-rails to replace existing track in various parts of the city.

### *Shops and Buildings*

**Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa,** suffered a loss of $8,000 when flames threatened its carhouse. Four cars were damaged.

### *Trade Notes*

**American Steel Foundries, Chicago, Ill.,** has moved from the McCormick Building to the Wrigley Building, 410 North Michigan Avenue.

**K. D. Hequembourg,** at one time director of exhibits and vice-president of the American Electric Railway Manufacturers' Association, has been appointed state commissioner of Missouri for the National Association of Builders' Exchanges. His duties will consist of acting as state representative of the national association, looking after state and local affairs. He will have the power to organize local associations. He has lately been executive secretary of the Builders' Exchange of St. Joseph, Mo.

**Buda Company, Harvey, Ill.,** is extending its railway switch plant.

**Economy Electric Devices Company, Chicago, Ill.,** has received an order from the Key System Transit Company, Oakland, Cal., for the equipment of all of the motor cars on that property with Economy meters. This order will call for about 450 meters.

**J. M. Pneuman, Berea, Ohio,** has been appointed sales agent for the Transit Equipment Company, New York.

**Union Switch & Signal Company** will move its New York office from its present location in the Benenson Building, 165 Broadway, to the new Westinghouse Building, 150 Broadway, on May 1. The new quarters occupy the greater part of the twenty-second floor of the Westinghouse Building. They are larger and better arranged and can be reached more conveniently.

**William Lintern,** president of the Nichols-Lintern Company, Cleveland, Ohio, manufacturer of railway, vehicle and mill supplies, sails for Europe May 8 for an extended business trip.

### *New Advertising Literature*

**Heine Boiler Company, St. Louis, Mo.,** has issued Bulletin 54, an illustrated pamphlet on the bent-tube boiler V-type.

**Tide Water Oil Sales Corporation, New York, N. Y.,** has issued "An Unusual History of Petroleum." The book is a reprint of twelve mailing pieces which were used during the past year in a direct advertising campaign among users of lubricating oils and greases.

New York, May 3, 1924

# Electric Railway Journal

*Consolidation of Street Railway Journal and Electric Railway Review*
Published by McGraw-Hill Company, Inc.
HENRY W. BLAKE and HARRY L. BROWN, *Editors*

*Volume 63*
*Number 18*

## Clean-Up Week Is Here Again

WHILE in some parts of the world May Day is the signal for strikes and anarchistic demonstrations, in this country it heralds the opening of the annual spring cleaning week that has become national in character, being sponsored by the United States Chamber of Commerce. Not only for the individual household, but for business and industry generally, there is a need to dispose of the accumulated rubbish of the winter and prepare for the open season.

It is not merely an esthetic urge that causes civic bodies to stand back of the movement. A definite relationship has been established by the insurance interests between cleanliness and fire prevention. Litter and accumulation of rubbish are every year directly responsible for the destruction by fire of hundreds of thousands of dollars worth of property. So clearly is this recognized that a penalty is included in the standard fire insurance policies for poor "housekeeping."

So let this be the signal to start the best clean-up that ever has been staged on your property.

## Even New York's Subway Is 40 per Cent Elevated

MUCH discussion about the obsolescence of elevated railways has arisen in the New York press in connection with two reports on the Brooklyn elevated railways presented by three city and three independent engineers. These reports were called for because of the accident last June when two cars left the track and fell off the structure, and the engineers were instructed to report particularly on the safety of transportation on these lines. They have made several helpful suggestions and have recommended the strengthening of the structures in a number of ways because of the increased traffic carried over them.

Nowhere in either report, however, is there any indication that elevated railway travel cannot be made safe, or that an elevated structure provides an obsolete method of city transportation. Traveling is certainly much pleasanter in the open air than underground, and the figures in New York City, even with the old forms of elevated railway there in use, show that the running time is not much different between elevated and subway.

Since an elevated railway can be built for very much less per mile of track than a subway, the former is possible in a great many places where a subway would not be financially practicable. When built in developed districts, the cost of an elevated railway is increased by the extent to which damages can be collected by abutting property owners. This may be a very considerable addition. But even if such damages amount to as much as the cost of construction itself, the cost would still be only about half to two-thirds that of a subway.

Because of the expansion of the subway system in Manhattan Borough, many municipalities where the traffic is not so great believe that the only rapid transit system suitable for their condition is the subway. The fact is that in New York 61 per cent of the entire rapid transit system is elevated, and that even the so-called subway division of the Interborough Rapid Transit Company includes elevated lines to the extent of 40 per cent. So if these cities wait until they can afford subways, they may wait a long, long time.

## Recent Financial News Is Significant

FINANCIAL history is being made fast by the electric railways this year. Not only have the Pittsburgh and Birmingham receiverships been lifted, but material progress has been made toward restoring the properties in both St. Louis and Kansas City to their owners. Best of all, however, are the evidence of greater willingness on the part of bankers to participate in electric railway offerings, the decided increase in interest in railway issues among investors, and the ability of the companies to do their financing at rates that may be regarded as reasonable.

Within the past few days a test has been furnished in financial circles by an offering of $3,200,000 of 7 per cent bonds of the Grand Rapids Railway sold at 99½ to yield 7 per cent plus, followed by an offering of $3,000,000 of Pittsburgh Railways 6 per cent car trust gold bonds, sold to yield 5.22 per cent to 6 per cent. The Grand Rapids issue took well. The alacrity of the investor to participate in the Pittsburgh issue was so great that the subscription books were closed in an hour.

Similarly an offering of Southern Pacific Company 5 per cent equipment trust certificates was readily subscribed on a 5.08 per cent offering basis. More than sixty street cars for use on the electric lines of this company's subsidiaries were included among the equipment pledged to secure this loan.

In the light of these and other recent developments significance attaches to the recent comment of an investment banker to the JOURNAL that gradually the impression among investors is being eradicated that electric railway securities are selling on a bankrupt basis. As a matter of fact, the securities of the electric railways are not financially far out of line with respect to other issues. A study made recently of eighteen fairly representative issues, including some of the highest priced as well as some of the highest yielding issues, shows an average basis of 6½ per cent. The high of this list is 8.40 and the low 5.41 per cent.

The evidence of betterment along these lines shows the improvement to be gradual, but it is sounder because of that fact. The reasons behind it are fundamental and we may therefore look for continued progress.

## The Desirability of Even Headways

IN AN EDITORIAL in the March 15 issue, under the heading "Make Your Headways Sell Your Service," this paper pointed out the desirability, where possible, of scheduling city car lines with even parts of the hour as the spacing between cars. This was urged on account of the greater ease in remembering leaving times with such an arrangement, and was based on the sound logic that the easier it is for the individual to know when he can get a car, the more likely he is to use it.

Issue is taken with several of the points made in the editorial refered to by Joe R. Ong in a communication published in the JOURNAL, issue of April 26, page 656. He cites a number of specific instances where he feels that it is unwise to determine the headway from the standpoint of the convenience of the passengers. Mr. Ong's discussion of time-table construction is quite worth bringing out, but most of his examples are such as were carefully excluded from consideration in the previous JOURNAL editorial by the premise, "When the service is infrequent........"

It is true that conditions will arise in working out the schedules for any system which limit the application of even headways. The main thing to remember is that if the headways are such that the spaces are even fractions of the hour, the cars will leave at the same points on the clock, hour after hour.

In other words, with certain numbers of scheduled cars per hour, the spaces are easier for the passenger to remember. Thus, four, five and six cars per hour correspond respectively to headways of 15, 12 and 10 minutes. It is easy to keep in mind that the cars run every quarter-hour. If they leave, say, three minutes after the hour this can be carried through in the mind of the passenger with little difficulty. Such even fractions of an hour are not difficult to remember. But an 11-minute headway, for instance, does not recur on the same minutes for eleven hours, and the rider just has to stand on the corner and wait for the car to come along.

While it is desirable in some cases to give suburban service by extending out occasional cars on a city line, it does not necessarily follow that it must lead to odd headways. The point made in the previous editorial was that the problem should be studied to see if it is at all possible to schedule such cars so that the headways will be even. This cannot be done economically in every case, but it certainly is worth an effort to try to effect some such combination. Furthermore, it may be quite desirable in specific cases to separate completely the suburban service from the city service, as a measure of making the former more reliable.

The difficulty with the time-table expert sometimes is that he has the technical point of view only. He fails to see that in gaining the last one-tenth per cent of efficiency he may cause the loss of patronage. For instance, the time-table department that operated a 13-minute line in the more thickly populated district and a 26-minute line to a suburban terminal (an actual case, by the way) certainly had little thought for making the service readily salable. Knowing the line, it seems quite possible that it would have been practicable and decidedly better to operate cars on 15 and 30-minute headways with a saving over what actually was operated.

The spacing of trains and single cars on a line, particularly during the rush hours, was not considered in the editorial referred to above. It is a special subject and has little bearing on the question raised. Of course, as coupling the cars together into trains increases the size of the units, this will increase the spacing in handling a given traffic. This naturally makes even headways more desirable.

Mr. Ong brought interurban service into the discussion. In this, it is perhaps a good thing to have the cars on various routes spaced out so as to divide up the hour evenly. But in some cases there is a very positive advantage to the interurban road by making connections between lines at the terminal. A relatively small advantage like reduction of the maximum power demand or increase in the capacity of the passenger terminal may easily be outweighed by the disadvantage of missing connections. Many a traveler has changed his route in order to avoid a 40 or 50-minute wait at an interurban station, and has gone to the steam road, which, although the service was less frequent and the fare higher, adhered to a time-table which provided for direct connections.

## Birmingham Starts Auspiciously Under a New Deal

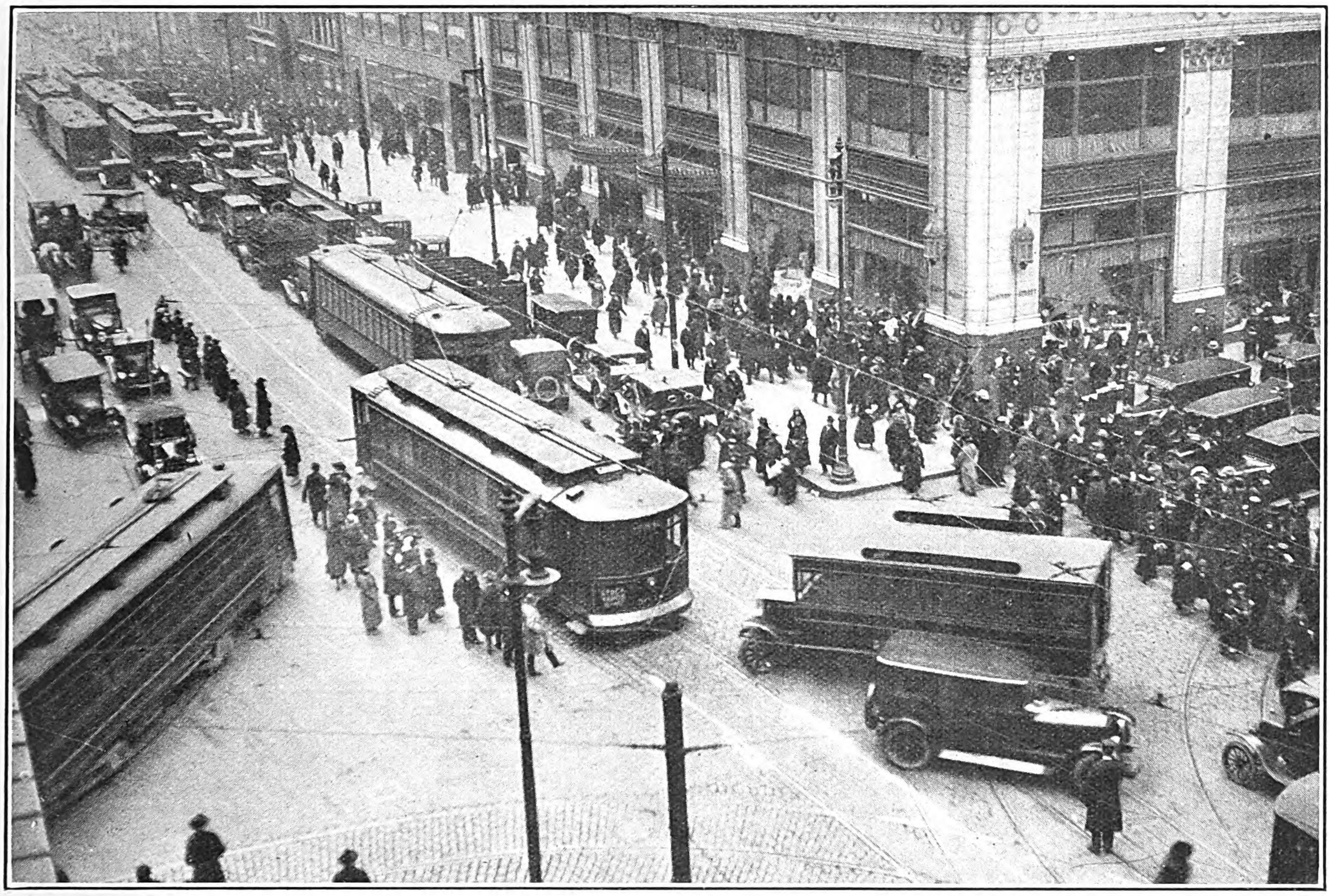
SO FAR as its principal utilities are concerned the city of Birmingham, Ala., is starting in afresh under a new deal. The reorganization of the Birmingham Railway, Light & Power Company has been effected, and the successor company, the Birmingham Electric Company, has begun to function under conditions that promise much for the future, both to the company and the city.

Under the terms of the settlement expiring franchises covering short sections of line have been unified with respect to their future maturity; most of the so-called Tidewater lines, threatened with extinction, have been retained; the financial set-up of the successor company has been placed on a modern basis with respect to provision for future financing; fares have been reduced at a saving to the public of about $500,000 a year, made possible largely by removal of the jitney menace, and arrangements have been made to substitute double-entrance cars, with partitions separating the races, for the single-entrance cars, thus settling a race question without the matter becoming a public issue.

This is a bare outline of some of the outstanding accomplishments. Commissioner William L. Harrison has pointed to them for the benefit of the people in a statement which he has just issued. His pride in the part played by the body of which he is a member in consummating the settlement is pardonable. It is too bad that it is not given to more city officials to see the utility situation as Mr. Harrison sees it, for a city is judged largely by its utilities. Mr. Harrison has aptly said that the functions which the utilities perform reflect themselves into every household and family in the city, into every commercial and business interest and into the very life, development, progress and prosperity of the city. Cognizant of this, both sides to the negotiations in Birmingham were prepared to make concessions. Best of all, the spirit of amity and good will which marked the negotiations has been carried over in working out the details of the settlement problems and gives every evidence that it will continue.

# Chicago Loop Rerouting Would Increase Capacity for Cars 30%

### Reduction of Number of Left-Hand Car Turns and Rearrangement of Lines to Give Maximum Relief in Traffic Interference with Minimum of Inconvenience to Street Car Patrons Proposed in New Rerouting Plan for Chicago Surface Lines



A Third Track for Three Blocks on State Gives a Loop for the Heavy Madison Street Line and Other Lines Without Interference with the Through Lines on State. A Clear Example of the Evil of the Left-Hand Turn for Vehicles Is Seen in This Picture

REROUTING of lines in the downtown Loop district of Chicago, with a view to relief of traffic congestion in so far as it is created by the operation of street cars, is recommended in a report by Major R. F. Kelker, Jr., to the committee on local transportation of the City Council. This report was prepared at the direction of the chairman of the committee and with the cooperation of the board of supervising engineers and officials of the Chicago Surface Lines. It aims to present a means of relieving traffic congestion without an elaborate track rebuilding program, and at the same time it offers the possibility of increasing the number of cars entering the downtown district by 30 per cent.

The following improvements in conditions within the downtown district would result with the installation of the new plan, according to the report:

| | Present | Proposed | Decrease | |
|---|---|---|---|---|
| | | | Number | Per Cent |
| Ltft-hand turns | 25 | 5 | 20 | 80 |
| Right-hand turns | 38 | 26 | 12 | 34 |
| Sub-terminals | 3 | 1 | 2 | 67 |

The general plan proposed has been to eliminate as many left-hand turns as possible and at the same time cut down the number of right-hand turns required inside the congested area. This is accomplished for north and south side cars entering the Loop district by routing them on through the congested area before looping them back. Cars from the west side of the city are looped on Dearborn Street instead of on State Street, thus making the southbound track on Dearborn Street virtually a terminal track for westbound loops.

The proposed rerouting will eliminate the use of the third track on State Street between Lake and Madison, will eliminate stub-terminals at two of the busy corners, namely, at Adams and State and at Van Buren and State, and will eliminate all "round the block" loops.

The proposed plan will place outside of the district bounded by the Chicago River and Harrison Street 80 per cent of the left-hand turns and 34 per cent of the right-hand turns now in effect within this district. This has been accomplished by increasing the size of the various loops and, where possible, routing the north and

south through-route cars through the congested area without turns. The two stub-terminals will be replaced with loops.

The proposed loops have all been laid out to be one block wide and several blocks long, the latter dimension being in the general direction of the destination of the route. All loops have been laid out for one left-hand turn and three rights, and, as far as possible, to have the outbound side of the loop on the street from which the route derives its name.

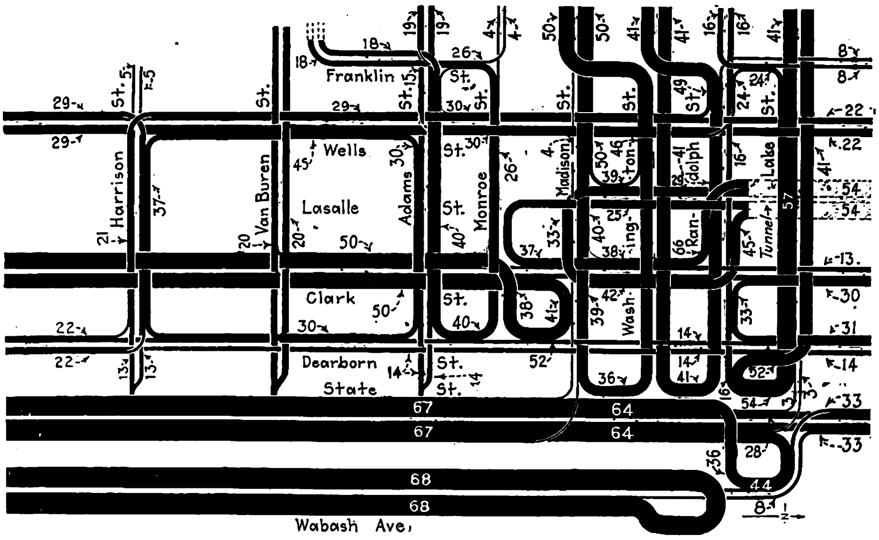
In all, twenty-one routes which at present terminate within the downtown district are to be rerouted. Eleven through-route lines are also to be rerouted in order to bring the routes through the downtown district on a less congested street or without turn in the district.

### REMOVING CARS FROM LOOP DISTRICT ALTOGETHER HAS SERIOUS DISADVANTAGES

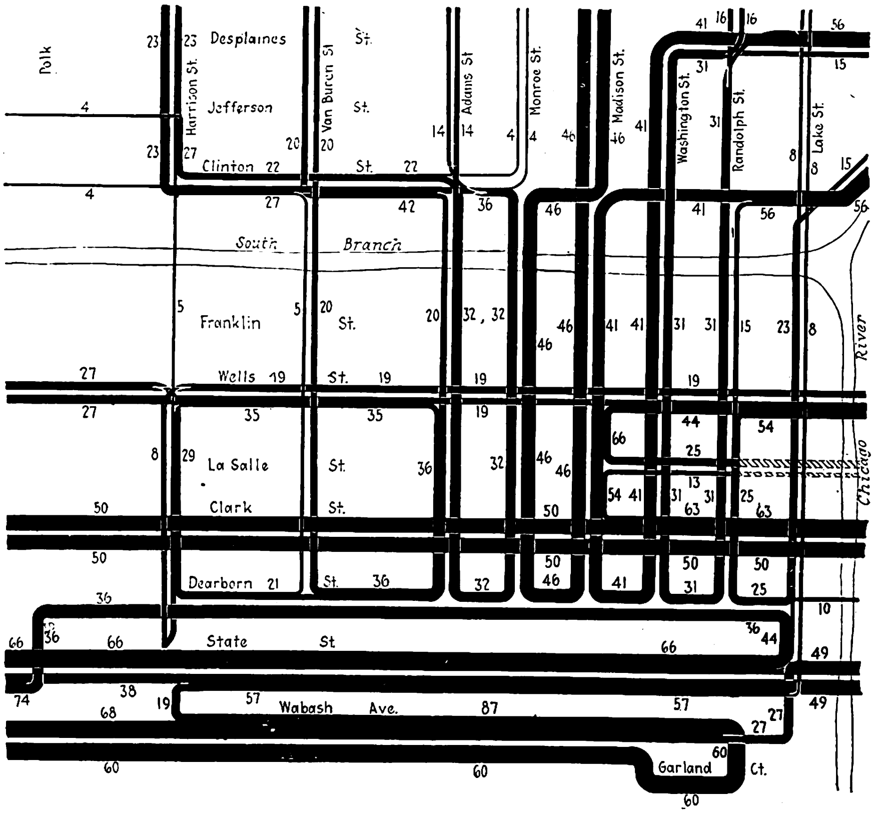
Because of the constantly increasing volume of pedestrian and vehicular traffic in the congested area, the subject of removing all surface street car routes from the Loop district has been frequently discussed. Major Kelker's analysis showed such a scheme to be impracticable because of the following disadvantages:

1. The street car using public (approximately one-half of the daily occupational population of the downtown district) would be seriously inconvenienced in getting to and from their places of business or employment.
2. The concentration of traffic at points on the edge of the district to which the street cars were moved would be such as to create seriously congested conditions at loading points.
3. The congestion would not be lessened in the Loop district for the reason that it requires only about 10 seconds for from 40 to 100 persons to be carried across a street intersection in a street car (from one-tenth to one-quarter of a second per person). It would require about 13 seconds per person on foot even if there were no vehicular interference. This conclusion is based on actual traffic studies.

For these reasons it was thought clear that the possibility of reducing traffic congestion by moving the street car terminals closer to the edge of the Loop district would not furnish a solution of the problem of congestion. This left two alternatives: (1) Complete through routing of all lines, and (2) removal of the terminal loops, particularly of the west side lines, to a point where they would cause the least interference with other lines, and through routing of north and south lines as far as it was consistent with economical operation and maintenance of good service.


Franklin St.
Wells St.
Lasalle St.
Clark St.
Dearborn St.
State St.
Wabash Ave.
Harrison St.
Van Buren St.
Adams St.
Monroe St.
Madison St.
Washington St.
Randolph St.
Lake St.
Tunnel

**Present Surface Car Routing in Chicago Loop District, Showing Number of Scheduled Cars on Each Section of Track**


Polk
Desplaines St.
Jefferson St.
Clinton St.
Harrison St.
Van Buren St.
Adams St.
Monroe St.
Madison St.
Washington St.
Randolph St.
Lake St.
South Branch
Franklin St.
Wells St.
La Salle St.
Clark St.
Dearborn St.
State St.
Wabash Ave.
Garland Ct.
Chicago River

**Proposed Loop Routing, Chicago, Which Would Eliminate Turning Movements from State Street and Move Many Turnbacks to Points Beyond Congested District**

Complete through routing was considered impracticable not only from an operating point of view, but also from the standpoint of maintaining regularity and adequacy of service. In addition, through routing of west side lines with north and south side routes and vice versa would give no material reduction in right-hand turns and would actually cause a considerable increase in the number of left-hand turns.

Careful study of the traffic situation in the Loop area, bounded by Lake Street, Wabash Avenue, Van Buren Street and Wells Street showed that under the present routing street cars interfere both with their own movements and with the movement of all other traffic because of a large number of left-hand turns at important intersections. In addition, it was found that the movement of the street cars is retarded by pedestrian and vehicular traffic, and vice versa, on the west side of State Street at the intersection of Randolph, Washington and Madison Streets, because of the existence of right-hand turns on the important west side routes operating around these intersections. It was also found that the north-bound track on State Street was being used beyond its reasonable capacity, particularly when the number of different routes operating over it and the congested condition of the streets was considered. Still further analysis showed the stub-terminals on Adams Street at State Street and on Van Buren Street at State Street to be a serious hindrance to the proper movement of both street cars and other vehicular traffic.

### ADVANTAGES OF REROUTING SUMMARIZED

The chief advantages of the proposed routing are summarized as follows:

1. Greater facility of movement of all classes of traffic at the heavy traffic intersections.
2. Operation of cars serving the same section of the city are carried over a common route in the downtown district in so far as practicable.
3. The number of interlocking loops in the downtown district is reduced to a minimum. The disadvantage of an interlocking loop is pointed out to be that a car failure at certain points on one loop rapidly blocks traffic on the connecting streets so as to tie up adjacent interlocking loops and consequently may tie up many lines.
4. Substitution of loops for stub terminals in the heavy traffic area.
5. Elimination of practically all left-hand turns from the most congested part of the heavy traffic area as well as a reduction in the number of right-hand turns.
6. Removal of curve movements from heavily congested intersections as far as possible. Under the new plan, within the district bounded by Lake Street, Wabash Avenue, Van Buren Street and Wells Street, curve movements are confined to Dearborn Street with the exception of comparatively few on Monroe Street.
7. The proposed plan practically accomplishes the results that through routing of north and south side lines would accomplish in so far as traffic movement in the congested section would be affected by such through routings.
8. Presents an improved opportunity for emergency routing without causing delays to other lines.
9. Effects the greatest utilization of east and west streets having the widest roadways and provides better balancing of traffic.
10. Provides for the operation of three of the principal middle southwest side lines closer to the center of the business district without increasing congestion.
11. Reduces the number of passengers transferring in the heavy traffic area.
12. Makes provision for better service between the Union Depot and the center of the downtown district.

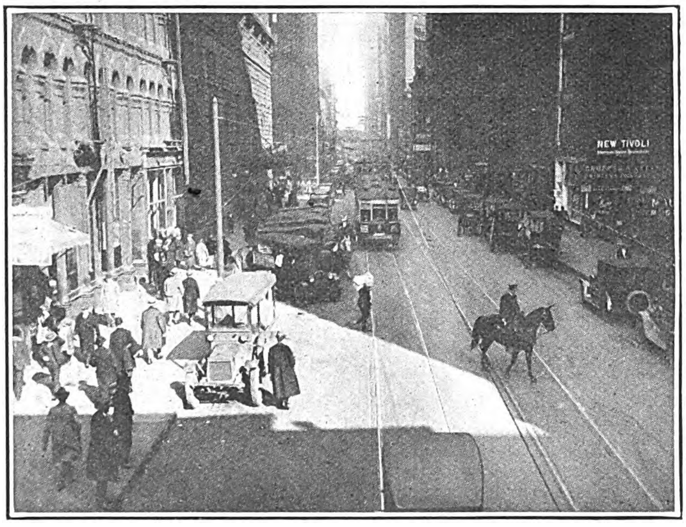
### DISADVANTAGES OF THE PROPOSED PLAN

1. The transferring of passengers in the downtown district between the Ogden, Elston and Division Street lines and the State Street lines and through routes 1 and 3 would be eliminated; also between the Milwaukee, Armitage, Madison, Harrison and Van Buren Street lines and the State Street lines.
2. Passengers using the Southport, Sedgewick-Dearborn and Riverview-Larrabee lines to and from points lying south of Kinzie Street would be required to transfer.
3. Passengers using the Canal-Twenty-first Street and Fulton Street lines to and from points east of Clinton Street would be required to transfer.
4. Passengers traveling from the north to the Polk Street Depot, excepting those using the Clybourn lines, would be required to use cars operating on State Street or Clark Street.
5. Some of the patrons of a few of the lines operating in the loop district would have to walk an additional block or two to board cars.

### GENERAL OBSERVATIONS ON PROPOSED PLAN

In no case have the cars on a heavy traffic line been removed more than one-sixth of a mile (880 ft.) from their present route, and in the majority of cases the change is only one-twelfth of a mile (440 ft.)

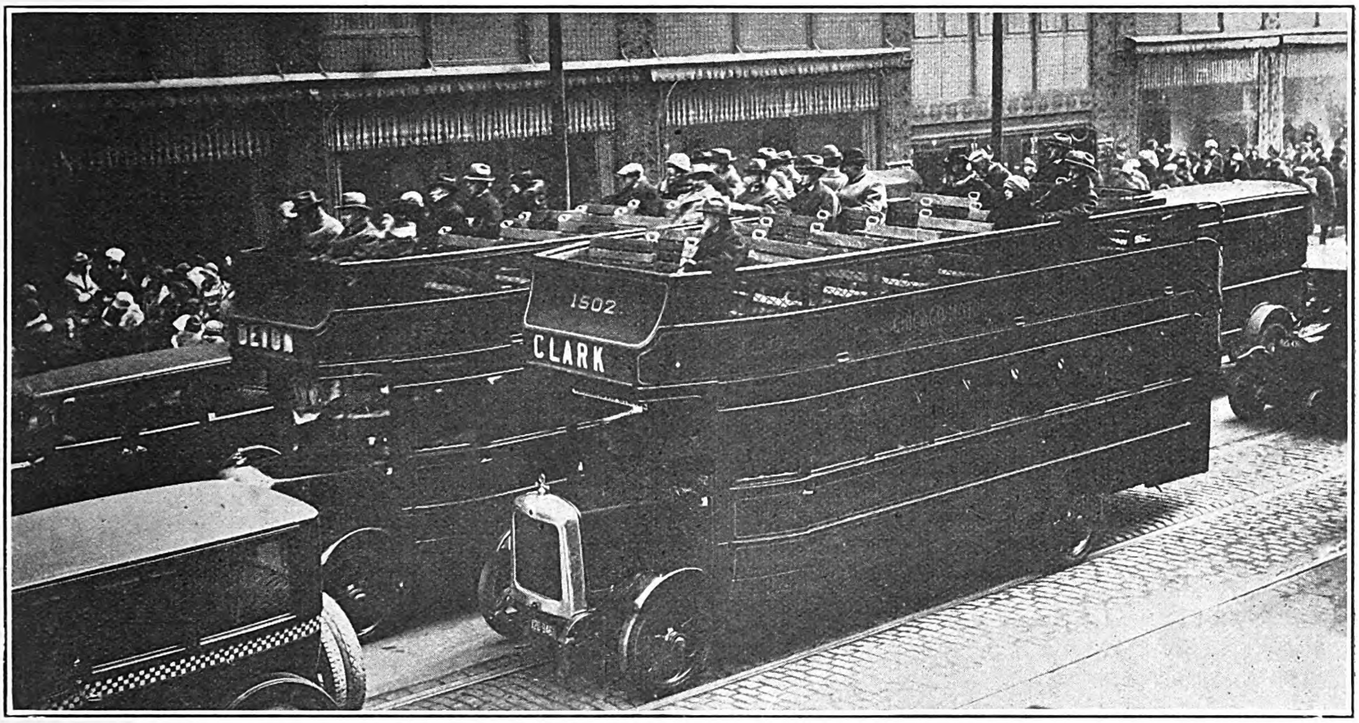
Although the elimination of transfers between certain west side lines and the State Street line and through routes 1 and 3, mentioned under the list of disadvantages, would appear to be objectionable, it would only entail a slight inconvenience to a comparatively few and



On Madison Street, Which Is 80 Ft. Wide, Parking Seriously Interferes with the Movement of Vehicles. It Is Totally Prohibited During the Morning and Evening Rush Hours. Looking East from Wells Street

VAUDEVILL AND
FEATURE PHOTO AYS
POPULAR I ICES
ND BOX
REVUE

Fortunately State Is a Good Wide Street and Will Accommodate a Very Heavy Flow of Traffic, but the Numerous Great Department Stores Which Are Located on It Overtax Its Capacity



Buses, While Carrying Many People, Also Add to the Congestion on Car Line Streets in the Loop

no passenger would be prevented from reaching his destination for one fare.

### TIME STUDIES IN TRAFFIC MOVEMENT

From a number of traffic studies made in the Loop district, it was found that in general the traffic interval at street intersections is governed by the vehicular traffic flow and that this traffic interval with respect to time allowed is about evenly divided between traffic moving north and south and traffic moving east and west. Street cars must move coincidentally with vehicular traffic, and therefore the amount of time required to move street cars past the north and south or east and west controlling points at an intersection must not exceed 900 seconds in any half hour.

It was determined from checks made at various times that the amount of time necessary for a street car to make a straight crossing, right-hand turn and left-hand turn is, on an average, 10 seconds, 15 seconds and 20 seconds, respectively. These time allowances were applied to the number of cars scheduled to operate through the intersections to find the total time required to move cars during any period of time and were considered in laying out the routing shown on the proposed plan.

As stated above, the total time for east and west or north and south traffic movements should not exceed 900 seconds, or a total of 1,800 seconds for movements past the intersecting points in all directions in any half-hour period. A study of the conditions existing at several important terminals under the present routing disclosed the following situation:

TIME NECESSARY TO MOVE CARS IN MAXIMUM HALF-HOUR DURING EVENING RUSH

| Intersection | Seconds |
|---|---|
| North and South Lines | |
| Wabash and Washington | 980 |
| State and Lake | 950 |
| Dearborn and Lake | 1070 |
| East and West Lines | |
| Wabash and Randolph | 1200 |
| Clark and Madison | 990 |
| Clark and Monroe | 1020 |

Thus there are now six intersections in the heavy traffic area where the time necessary to move the cars is in excess of the time allowed for vehicular traffic. This causes these points to be limiting points so far as the operation of street cars is concerned and they consequently are sources of congestion.

In addition, therefore, to the elimination as far as possible of left-hand and right-hand turning movements, the problem of reducing the limiting points in the heavy traffic area to a minimum presented itself. This problem was carefully considered in the rerouting plan proposed and the number of limiting points was reduced from six to three. The points remaining are as follows:

| North and South Traffic | Seconds |
|---|---|
| Wabash and Washington | 900 |
| Clark and Monroe | 935 |
| East and West Traffic | |
| Wabash and Randolph | 1200 |

The limiting points have been removed from the heavy traffic area to points nearer the edge of the downtown district and in some instances to points outside of the district at which places the movement of street cars and not the movement of vehicular traffic governs the traffic movements at intersections. The time necessary to move cars at each intersection in the heavy traffic area has been made more uniform and the extremes have been reduced to a minimum. This indicates better balancing of street car traffic at the intersections. Although the time required at some of the intersections for east and west or north and south movements is in excess of 900 seconds for the maximum half-hour, the traffic at the intersections where this occurs is such that street cars will have free movement because vehicular traffic does not govern the total flow as it does at some of the more heavily congested intersections.

In addition to a reduction in left-hand and right-hand turning movements, the proposed routing has been laid out so that heavy straight crossing movements will be made at intersections without turning movements.

# Interborough to Have Enlarged Shops

### An Area of 26½ Acres Will Be Occupied with New Office Buildings, Repair Shops, Service Buildings and Separate Yards—Additions to the Present Shop, Not Including Equipment, Will Cost About $2,000,000

WITH the continual increase of rolling stock necessary to carry the traffic on the lines of the Interborough Rapid Transit Company, New York, has come a pressing need for more adequate shop facilities. Accordingly, the company is now making additions to its 148th Street shop. When completed an area of 26½ acres will be occupied by the present and new shops, office buildings, service buildings and storage yards. The new buildings will extend from 147th Street to 151st Street between Seventh Avenue and the Harlem River, and additional storage space will be available between Lenox Avenue and the Harlem River as far south as 145th Street. The Lenox Avenue subway has a station at 145th Street and two tracks will run from this into the shop yards.

To secure additional space and provide facilities for receiving materials the bulkhead line along the Harlem River is being extended by permission of the War Department. A large amount of heavy supplies come by water, such as castings, rails, ballast, sand, car wheels and timber. The location of the yards along the Harlem River is particularly convenient for receiving such supplies.

The buildings now nearing completion constitute the third addition to the 148th Street shop. The first consisted of an extension of the shop east toward the Harlem River. The second was an addition to the south side of the shop throughout its entire length to provide facilities which, with the new arrangement, will be used as a blacksmith shop, mill room, wheel shop and repair shop for wrecked cars. The third addition, which is now under construction, consists of the general repair shop, an administration building, section for electrical and machine repairs, together with two service buildings, one for the stores department and the other for the way and structures department. The accompanying plan shows the arrangement of the shops and yards and indicates the various additions. The first and second are now completed, the third is under way and will be finished by midsummer.

The original shop and the first and second additions are now being used for maintenance work. The equipment in these portions at present will be rearranged as soon as the third addition is completed. The arrangement shown on the accompanying drawing is for the shop as it will ultimately be equipped.

A new administration building for use of the transportation, mechanical, electrical and track departments is being constructed at the northeast corner of Seventh Avenue and 147th Street. The building is of reinforced concrete throughout and has five stories and a basement. The first floor is on the street level. The general shape of the office building is that of an L, which extends along Seventh Avenue for a distance of 105 ft. and along 147th Street for 136 ft. The basement will be taken up by storerooms and an instruction room for the car equipment department. The first and second floors will be used principally by the transportation department; the third will be occupied by the offices of the mechanical, electrical, and economy departments; the fourth, by the engineering department and statistical and test departments; the fifth, by the assistant general manager and his assistants. A large lecture room is provided on the first floor, which will be used for general instruction purposes, when it is necessary to assemble a considerable number of men.

The third addition to the general repair shop will be of steel and reinforced concrete construction. It will have a total width of 200 ft. and a length extending along 147th Street of 512 ft. There will be three bays. The first bay along 147th Street will be but 18 ft. high, as this part will not be provided with overhead traveling cranes, but instead will be served by an overhead telpher system with 4-ton telphers. This bay will be partitioned off for use as an air room, a machine shop and a department of electrical repairs.

The second and third bays will have a height of 45 ft. The front portion will be used as a general repair shop and the rear for truck repairs. Four tracks are to be provided in each bay with pits the entire length. The tracks will be laid with 15 ft. between centers and entrance will be from the storage yard at the Seventh Avenue end. When completed, the shop will be equipped with four 25-ton traveling cranes.

Sixteen 3-ton floor-controlled bridge cranes will be installed in the truck overhauling shop. In addition, an overhead telpher system will serve the truck shop at either end and connect with adjacent departments.

A small open transfer table will be provided along the east end of the truck and wheel shops. This will be used only for moving trucks and supplies for the wheel and truck shop and is not intended for shifting cars. The location of machines and equipment for the wheel and axle department, which is adjacent to the truck shop, has not been definitely decided, but wheel press and wheel lathe locations have been laid out and double-track connections perpendicular to the sides of the shop are being arranged to each machine. The telpher system, which is to serve this department, has been laid out so as to provide a continuous movement of material without interference.

One of the outstanding features of this shop design is the absence of transfer tables for the shifting of cars. This is accomplished by the use of ladder tracks at the Seventh Avenue end of the shop. Inside the shop the tracks are provided with pits, with the floor between pits constructed flush with the top of the rails. An accompanying drawing shows the construction.

The lighting circuits for the machine shop have been laid out in two ways to include both alternating and direct current circuits. There are alternating rows of 100-watt lamps with the wiring capacity arranged so that 200-watt lamps can be used if required. In addition, there are rows of direct-current, 40-watt side light clusters. The d.c. clusters will be spaced 16 ft. apart and the a.c. lamps will be located 14 ft. apart. The purpose of having the two systems of lighting is so that if one should fail the shops would not be in darkness.

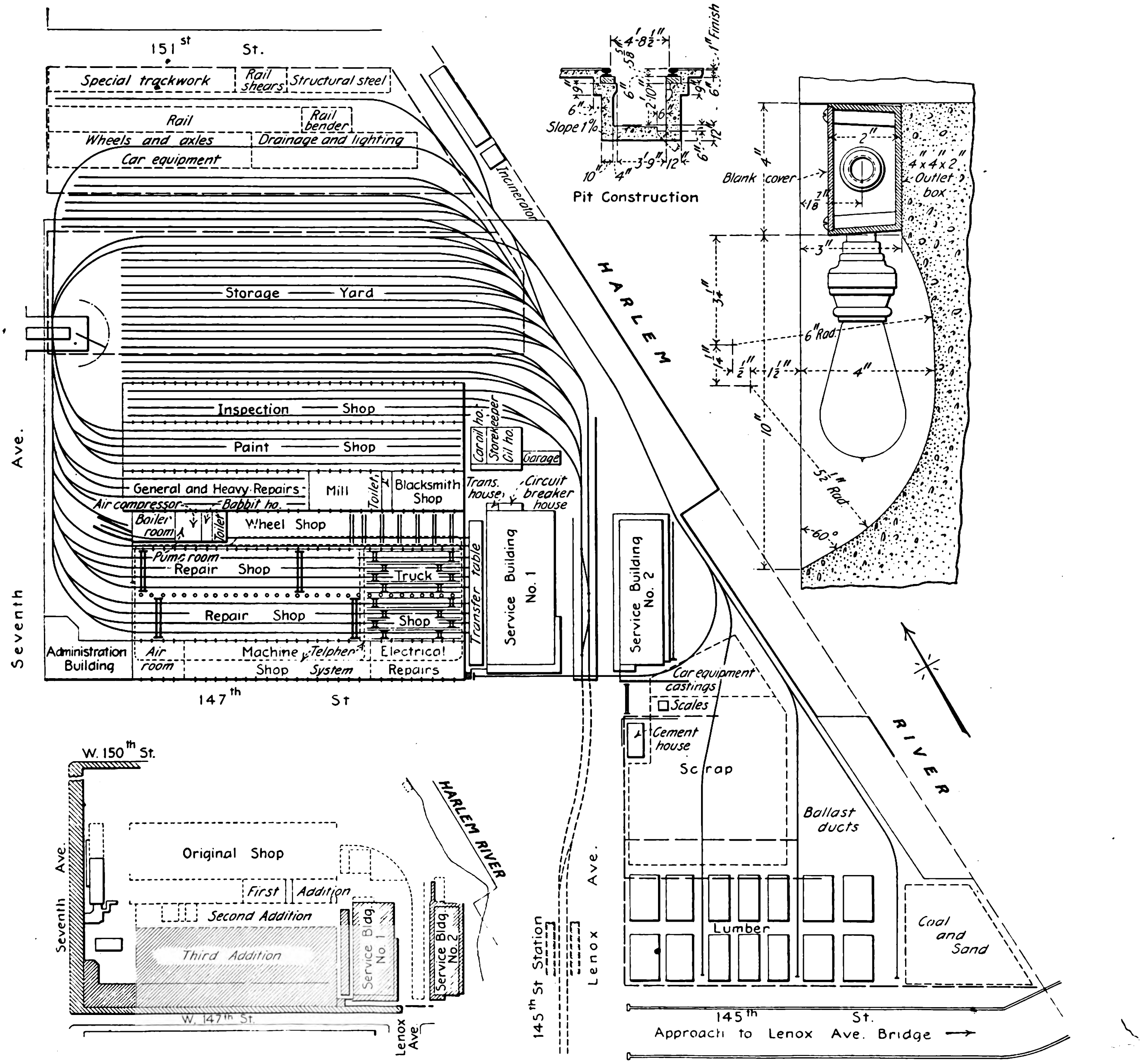
In addition to this general lighting, drop lights and hand lighting is provided at machine tools. The floor of the section, which will be used as a machine shop and department for electrical repairs, will be constructed of 2½-in. creosoted wood blocks.

Just east of the third section of the repair shop is a three-story building, which has been designated as Service Building No. 1. This will have a floor area of 235 x 106 ft. and will be used almost entirely by the stores department. The first floor will be taken up by a storeroom, a yardmaster's office and lunch, locker and washrooms. The second floor will be occupied by the stationery and lost property departments and the third floor will be used as a storeroom.

Another building, which is designated as Service Building No. 2, is essentially for the track and structures department. This building will have a floor area of 225 ft. x 66 ft. and will be two stories high. The first floor will contain a plumbing and tinsmith shop, a paint room, blacksmith shop and provision for the lighting department, track department and road engineers' offices. The second floor will have a carpenter shop and space for the signal department.

The foregoing details of building construction give a general idea of the extensive provision that is being made to take care of maintenance work for the subway division of the Interborough Rapid Transit Company. Considering the space for buildings and yards, this will be one of the largest electric railway shops in the world.

Preliminary tentative layouts of the tools and equipment for the enlarged shop have been made, but are not as yet ready for publication. The general arrangement, however, has been planned with the object of permitting the greatest possible economy of operation by a minimum movement of men and materials. A description of these layouts will be given in a future article.


151st St.
Special trackwork
Rail shears
Structural steel
Rail
Rail bender
Wheels and axles
Drainage and lighting
Car equipment
Incinerator
Storage Yard
HARLEM
Inspection Shop
Paint Shop
Car oil ho.
Storekeeper
Oil ho.
Garage
General and Heavy Repairs
Mill
Toilet
Blacksmith Shop
Air compressor
Babbit ho.
Trans. house
Circuit breaker house
Boiler room
Toilet
Wheel Shop
Pump room
Repair Shop
Truck
Shop
Repair Shop
Transfer table
Service Building No. 1
Service Building No. 2
Seventh Ave.
Administration Building
Air room
Machine Shop
Telpher System
Electrical Repairs
147th St
Car equipment castings
Scales
Cement house
Scrap
Ballast ducts
RIVER
Lumber
Coal and Sand
Lenox Ave.
145th St Station
145th St.
Approach to Lenox Ave. Bridge
W. 150th St.
Seventh Ave.
Original Shop
First Addition
Second Addition
Third Addition
Service Bldg. No. 1
Service Bldg. No. 2
HARLEM RIVER
W. 147th St.
Lenox Ave.
4'-8½"
1" Finish
Slope 1%
Pit Construction
Blank cover
4x4x2 Outlet box
6" Rod
5½" Rad.
60°

General Layout of the New Shops of the Interborough Rapid Transit Company. The Insert at Lower Left Shows the Order of Construction. Upper Right, Pit Construction and Arrangements for Lighting

## Boston Patrons Leave 44,000 Articles a Year on Cars

RECENT figures issued by the Boston Elevated Railway show that through carelessness patrons on its cars leave approximately 44,000 articles a year in the cars, trains or stations of the company annually. Approximately 75 per cent of these articles are returned to the owners. The practice followed in the lost and found department of the company is as follows:

Articles are turned in to the carhouse or division headquarters by the men finding them, and unless of considerable value they are sent to the lost article department at headquarters. At the same time a report is made out in duplicate, one copy being retained at the division headquarters and the other copy accompanying the article to the lost article department. In the case of money, jewelry or other valuables, the article, after being held three days at the division, is forwarded directly from there to the treasurer's office. In the meantime a report of the find is sent to the lost and found department.

Every effort is made to locate the owner of the found article. If there is any mark or identification on it, this is followed up. The lost and found article clerk also examines each day the lost and found advertisements in the papers and checks them with the records of his department.

All articles found are classified after they reach the department into ten different classes as listed below:

Class 1. Valuable articles, such as money, pocketbooks, jewelry, mortgages, deeds, other valuable papers, etc.
Class. 2. Personal belongings, such as keys, eyeglasses, pipes, buckles, etc.
Class 3. Gloves and mittens.
Class 4. Umbrellas, parasols, canes, etc.
Class 5. Books, photographs, printed matter, etc.
Class 6. Clothing of all kinds.
Class 7. Bags, suitcases, lunch boxes, etc.
Class 8. Hardware and heavy articles, tools, etc.
Class 9. Food, perishable property, etc.
Class 10. Miscellaneous—anything not included in above or anything containing articles of two or more different classes.

A card index of these articles is arranged chronologically, which makes it possible for the clerk to ascertain readily if an article has been turned in.

Money, jewelry or other valuable articles are held for a period of six months, and if unclaimed during that period, are then returned to the finder. Other articles are held for a period of sixty days before the return to the finder if unclaimed.

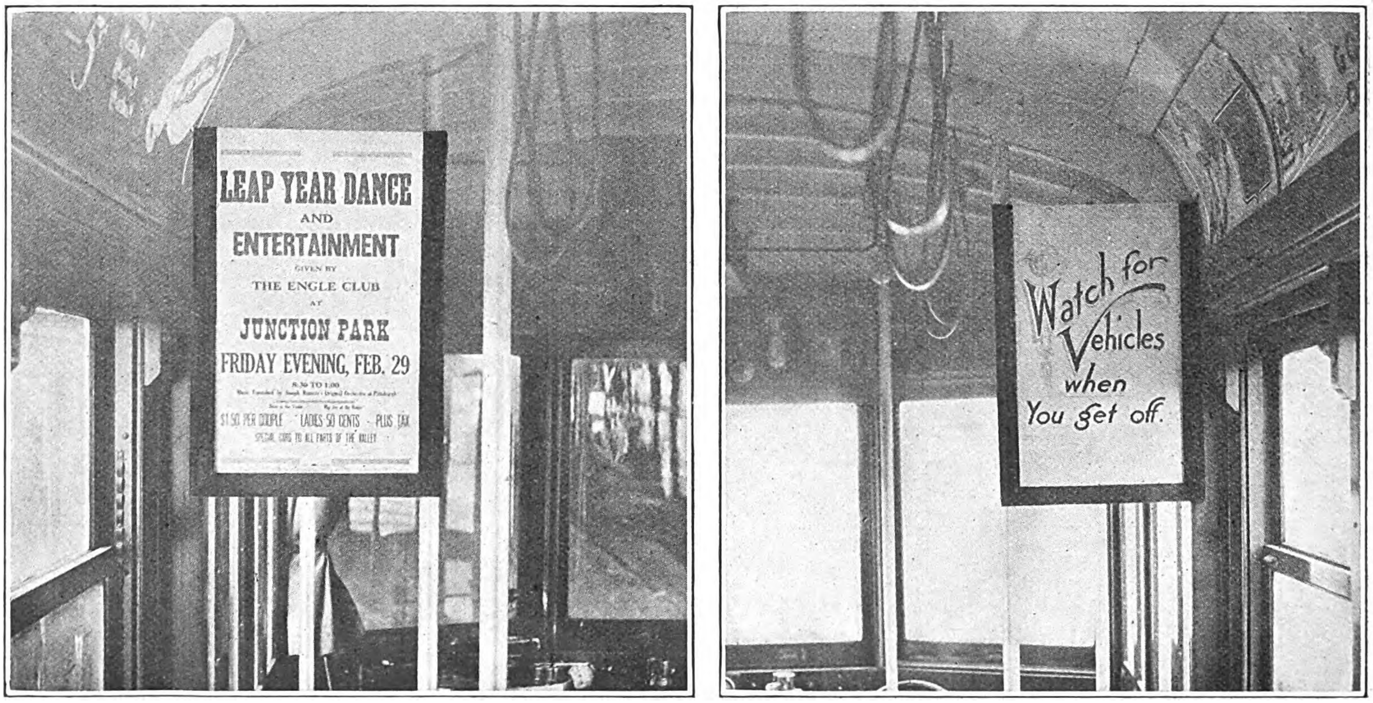
The company estimates that it costs about $1,800 a year for labor, printed matter and postage to maintain the lost and found department.

## A Motto on the Background of the Signboard

ADVERTISING racks for company use have recently been placed in the new double-truck one-man cars of the Beaver Valley Traction Company, New Brighton, Pa. The only convenient location where these racks could be installed was between the stanchions and the door posts at the ends of the car, as shown in the accompanying illustrations. In this position the cards are visible from anywhere within the car. The racks carry various signs used for the promotion of traffic. Care is taken to see that not more than one card of a particular kind is carried in any car.

Since the routine of inserting these cards in racks sometimes is interrupted, and in order to avoid the careless appearance which would be presented by an empty rack, the railway hit upon the idea of having a motto permanently painted on the back side of the signboard. If the card is missing the passenger reads the motto.

Near the exit doorway the permanent sign or motto reads "Watch for vehicles when you get off." On the reverse side of this sign, where it will be seen by passengers boarding the car, has been painted "We thank you for your patronage."


LEAP YEAR DANCE
AND
ENTERTAINMENT
GIVEN BY
THE ENGLE CLUB
AT
JUNCTION PARK
FRIDAY EVENING, FEB. 29
$1.50 PER COUPLE LADIES 50 CENTS PLUS TAX
SPECIAL CARS TO ALL PARTS OF THE VALLEY
Watch for Vehicles when You get off.

**Traffic Promotion Cards, as Shown Above, Are Carried in These Advertising Racks on the Beaver Valley Cars. If the Advertising Card Is Omitted a Motto Painted on the Background of the Signboard Appears. This Warning Sign Is Placed on the Board Near the Exit Door**

# Engineers Report on Brooklyn Elevated

### Ridgway-Swain-Klapp Committee Discusses Desirable Track and Equipment Standards in Its Report Just Finished on Brooklyn Elevated—Functions and Requirements of Guard Rails Considered at Length

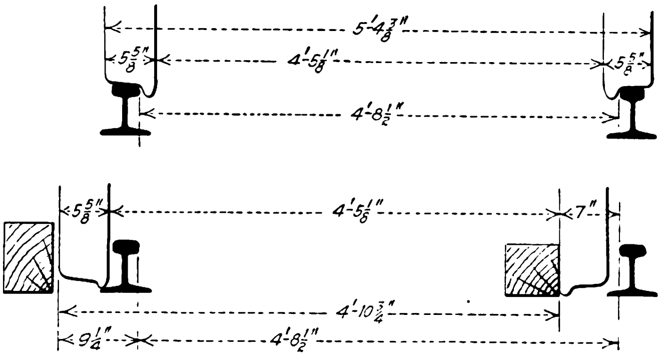
SOME suggestions on track and car maintenance, with comments on the condition of Brooklyn's elevated railway system, are contained in a report just made to the Board of Estimate and Apportionment, New York, by George F. Swain, Eugene Klapp and Robert Ridgway. These engineers represented respectively the Board of Estimate and Apportionment, the Brooklyn-Manhattan Transit Corporation, and the New York Transit Commission. This committee was appointed in July, 1923, after an accident on the Brooklyn elevated railways, in which both cars of a two-car train left the track, and the committee was instructed to report on "the present condition of the cars and road equipment in use on all of the elevated railroad lines in the city of New York." The present report relates to the lines of the Brooklyn-Manhattan Transit Corporation, which aggregate 46.861 miles in length. As many of the suggestions contained in the report are of application to other rapid transit lines, a brief summary of these general points will be given:

### GUARD TIMBERS AND TIES

The standard elevated railway track construction of the company on tangent calls for longitudinal timbers outside and inside of each rail, known as "guard timbers," of a 6 in. x 6 in. section. The outside guard timber is placed with its inner edge 11 in. from the inner or gage line of the rail; that is to say, about 8½ in. from the outside of the head of the rail, while the inner guard timber is placed 6 in. in the clear from the gage line of the rail. These guard timbers are bolted to alternate ties, the inside guard timber being bolted to the ties to which the outside guard timber is not bolted. If a derailment occurs, the function of the guard rails is to guide the derailed trucks.

The inside guard rail can do this better than the outside guard rail, for two reasons. The first is that if an axle with its wheels is derailed, the wheel which comes in contact with the inside guard rail will have its flange running along that guard rail, while if the other wheel is being guided by the outside guard rail, the outside of the tread will be running along that guard rail. It will be much easier for the wheel running alongside the outer guard rail to climb over it than for the other wheel to climb over the inside guard rail. In the second place, if a derailed wheel is guided by the inside guard rail, it is being retarded, while the other wheel on the same axle, if not against the guard rail, is not retarded. The effect of retarding the wheel which is running against the inside guard rail is to twist the axle in such a way as to turn the wheel toward the rail from which it fell. On the other hand, if the other wheel were running against the outside guard rail, that wheel would be retarded, and the effect of this retardation would be to twist the axle in such a way as to turn the wheels from the rails from which they fell and to facilitate their climbing over the guard rails. To enable the inside guard rail most effectively to guide a derailed truck, it should be smoothed, round and even on the side toward the track rail, no matter how uneven it is on the other side.

If the guiding is to be done by the inside guard rail, the clear distance between it and the track rail should be at least as great as the thickness of a wheel, or 5⅝ in. To allow some clearance for joints, etc., the inside guard rail should be not less than 7 in. from the track gage line. If so placed, the outside of the opposite wheel, as shown in the engraving, will be 9¼ in. from the gage line of track, so that the outside guard rail must be spaced at least this distance away in order that the inside guard rail may guide the derailed wheels. In fact, wherever the inside guard rail is placed, the outside guard rail should be at least 4 ft. 10¾ in. distant, measured from the inside edge of the inside guard rail.



Diagrams Showing the Action of Guard Timbers on Derailed Wheels

What then is the function of the outside guard rail? It is twofold. One function is as a precaution in case the inside guard rail should fail. The outside guard rail also holds the ties at the proper spaces and prevents their becoming bunched. The inside guard rail, however, is more important, and as its inner surface should present a smooth continuous surface to guide a wheel running along the ties, it is better to use steel rails as inside guard rails rather than timbers. These inside guard rails may be used rails and should be spiked and otherwise securely fastened to every tie, and placed at such a distance from the track rail that a wheel can roll freely between the two and will be guided by the steel rail before the other wheel on the opposite side of the same axle touches the outside guard timber.

There are other advantages of steel inside guard rails over wooden rails. The maintenance should be less, and they can be used, if desired, as an additional return circuit. Again, as the company substitutes new running rail for worn rail, the latter can be moved inward and used as a guard rail. At the approach to curves the committee recommends a change from this inside guard rail, 7 in. from the track rail, to the usual form of check rail, bolted to the inside running rail. At its outer ends this check rail should be curved outward toward the center of the track and an inclined casting placed between it and the track rail. This will provide a sort of rerailer to replace a derailed wheel on the track.

Ties may be renewed in two ways. According to the first method, if any single tie needs renewal, it alone is replaced. This method is suitable on steam roads, because the roadbed is elastic and each tie can be tamped to bring its top to the proper level. With the method of complete renewals all ties in a considerable length of track are renewed, though some of these ties may have some service life remaining. In general, this method is better for elevated railroads than the first method. On such lines if a single tie of a standard dimension is put in to replace a decayed one, it will seldom exactly conform to the level of the adjoining ties, and being new and sound, it will be more rigid than the adjoining ones under the application of the load. This means that it will lead to undue wear or deformation of the rails and fastenings, especially if the new tie is a joint tie, where the adjoining tie and others near it are poor.

Where this method is used, some of the good ties removed may be used again in other places, as in yards or footwalks, or where the track is on the ground.

The rigid enforcement of one system of repairs to the exclusion of all others is not advocated in the report. There may be many cases of split ties, burnt ties, or prematurely rotten ties, which it would be advisable to take out and replace during the fifteen or sixteen years of life fairly assignable to any considerable stretch of ties.

### CAR EQUIPMENT AND REPAIR

The company's rolling stock consists of 648 wooden motor cars, 259 wooden trail cars and 900 steel motor cars. The present report covers only the wooden cars, and the condition of the steel cars will be considered later. The report is based on an inspection of 10 per cent of the wooden cars, which were taken as typical of all.

The company's rules require that each car shall have a general overhauling once in fifteen months. At such times the trucks are removed from the cars and the motors from the trucks, and all parts of the body and truck are thoroughly cleaned, tested and put in good repair. Each motor car has a regular periodical inspection after 1,000 miles and every trail car after 1,400 miles, with an allowance of 150 miles above and below the specified mileage in each case. If this mileage is not made, the cars are arbitrarily ordered in for inspection, every sixteen days for the motor cars and thirty days for the trail cars. When a condition is found that is considered dangerous, the cars are ordered to be kept out of service until repairs are made.

The shop facilities of the company have not kept pace with its needs. This is shown in the accompanying table:

TABLE SHOWING INCREASE IN SHOPS AND ROLLING STOCK

| Length in linear feet of: | 1907 | 1923 | Increase Per Cent |
|---|---|---|---|
| Passenger cars | 45,190 | 104,892 | 132 |
| Track in inspection sheds | 6,122 | 8,192 | 34 |
| Track in repair shops | 3,864 | 4,344 | 12 |
| Track in total shop facilities | 9,986 | 12,536 | 26 |

The company could well consider the matter of offering bonuses to employees who discover defects in any important part of the equipment.

Throughout the report the committee makes certain recommendations of a general nature or specifically in regard to portions of the system.

Under track the committee specifies a number of places at which renewals of rails, ties, guard timbers, etc., should be made. It says that all of the company's track and decking is safe at present, but if not sufficiently maintained some parts will become unsafe. As regards the structures, it says that many of them, having been constructed a number of years ago, involve details which would not be considered good design now. Reinforcement is considered desirable in view of present stresses. Attention should especially be given to the protection of the column bases and to painting the structure. The recommendation for the rolling stock includes the grounding of the frames of all electric heaters, the interconnection of the dead man's button with the brake system to stop a train, a change from clear glass to an opaque material in the side window in the motorman's cab to prevent his attention being diverted by passing objects, more rigid inspection and a hastening of the construction of the proposed Coney Island repair shop.

### REPORT OF CITY COMMITTEE

The report of this committee of engineers was transmitted to the Board of Estimate by a committee of city engineers, made up of J. H. Delaney, G. P. Nicholson and A. S. Tuttle, making some additional recommendations. This report declares that a large amount of reconstruction will be required to the structure before it can be used for the operation of steel cars. A number of changes in the equipment were also recommended.

## Cash Register Issues Tickets

A NEW ticket-issuing cash register recently adopted by the Milwaukee Electric Railway & Light Company effects a considerable saving in labor. At the end of the day it gives the amount of sales for the day by companies and by ticket agents as well as the grand total of sales. It shows the number of tickets sold, the number of half fares, the number of full fares and much other accounting information. Moreover, it prints the tickets themselves. This machine is similar to the type used by the Chicago, North Shore & Milwaukee Railroad, use of which was described in ELECTRIC RAILWAY JOURNAL of Nov. 11, 1922, page 773.

Because of the large number of stations to which tickets are sold on the Milwaukee company lines it was found necessary to substitute key numbers for names of stations on the tickets which the machine prints. The ticket shows the date of sale, the serial number, the destination as indicated by a key number and the amount paid. The ticket is perforated at the top and when the conductor collects it and issues a receipt he tears off the upper part and uses that as a hat check. The lower or larger part is canceled by the conductor and turned in to the accounting department of the company.

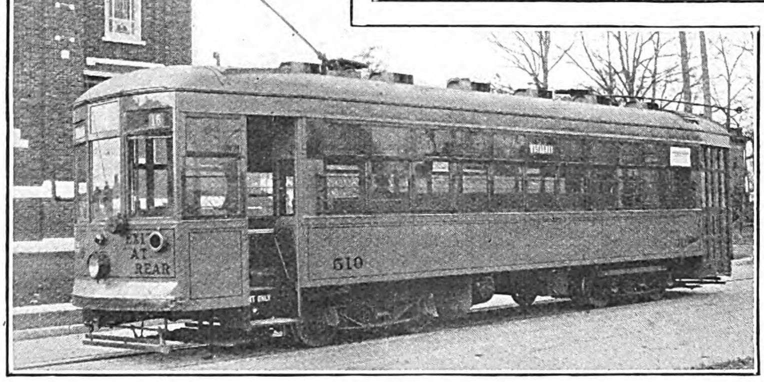
## Company Tells Where to Spend Week-End

AS A feature of the regular publicity material of the Underground Electric Railways of London, England, mimeographed sheets are furnished the press giving the locations where various events taking place over the week-end will occur, and the best routes on the company lines for reaching them. For special events, such as the annual boat race, similar information is furnished.

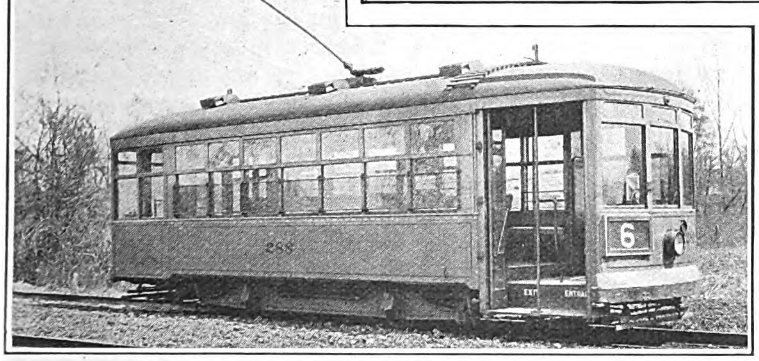
# Rear Exit Expedites Passenger Movement

### One-Man, Double-Truck, Light-Weight Cars for Fort Wayne Have Rear Exit and Inclosed Steps—Body Construction of New Cars Similar to Earlier Single-Truck Cars, Which Will Be Rebuilt with Rear Exit

SPECIAL attention was given to operating requirements in the design of the new double-truck, one-man cars built by the St. Louis Car Company and recently placed in service in Fort Wayne by the Indiana Service Corporation. A rear exit door, controlled and supervised by the operator, has improved passenger movement within the car and has decreased the time of passenger interchange. This rear exit became necessary when the company increased the size of the equipment from a 32-passenger single-truck car to a 44-passenger double-truck car. Even on the smaller cars congestion at the forward end greatly interfered with the movement of passengers. With the larger cars this congestion would have been more pronounced, therefore a rear exit door was installed in order to induce the passengers to go back to the rear of the car. The cars have proved so satisfactory that fifteen more have been ordered. Furthermore, the earlier equipment, consisting of 65 single-truck cars, will be rebuilt to include the rear exit.



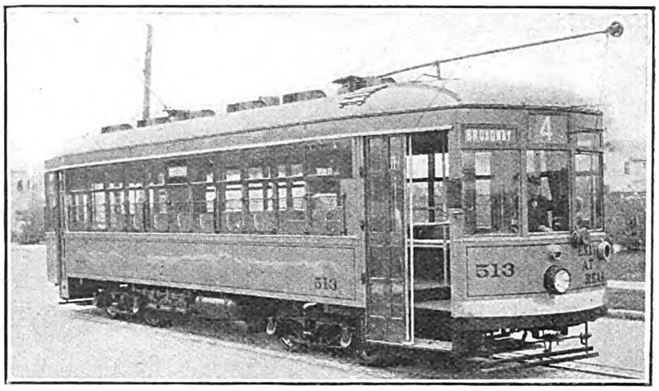
At Right—The Rear Exit Door Is Controlled from the Front End. The Operator Supervises the Rear Step Through Mirrors, and the Rear Step Is Illuminated by a Bank of Lamps in the Riser



Type of Single-Truck Car Used Heretofore in Fort Wayne Which Will Be Rebuilt to Include a Rear Exit and Other Improvements as Installed on the New Equipment

In general appearance the new double-truck cars are similar to the single-truck cars. They have arch roofs, straight sides, inclosed steps and 26-in. wheels. An effort was made to have the structural details of the two cars as nearly identical as possible. Platforms, body and roof construction are the same with minor exceptions caused by the difference in lengths of the two bodies. This similarity in construction was prompted by a desire to standardize the maintenance and repair work on the rolling stock.

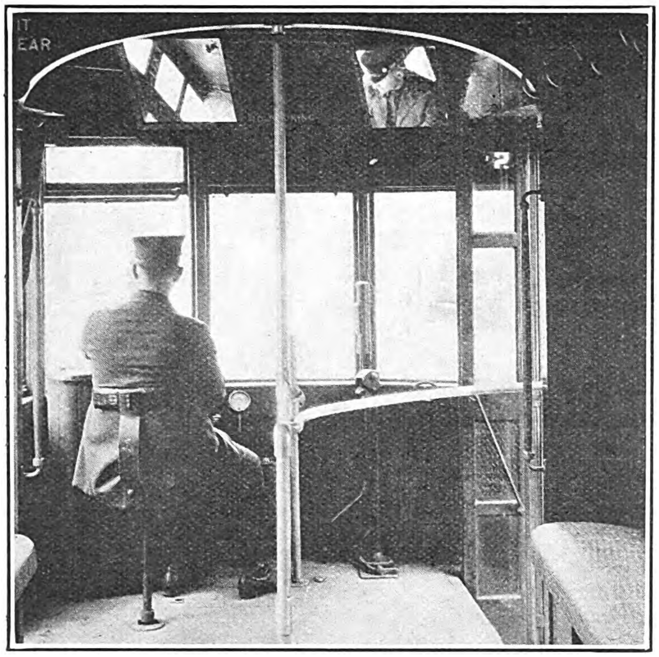
The car is operated by one man, which is standard practice in Fort Wayne, and is double-end equipped. Air-operated folding doors inclose the steps at front and rear. The double doors at the front may be opened individually or simultaneously. The rear door mechanism is interlocked with the controller circuit in such a manner that it is impossible to start the car with this door open. The forward doors are not interlocked with either the controller circuit or air brake apparatus.



Above—New Double-Truck, One-Man Cars with Rear Exit for Fort Wayne City Service. These Are Attractively Painted in Canary Yellow

The car is mounted on St. Louis arch bar trucks with 26-in. wheels. Four G.E. 264-A motors are inside hung on the trucks and are controlled by K-35 double-end control. The underframe is made up of 3-in. x 3-in. x $\frac{5}{16}$-in. angle side sills with 3-in. 6-lb. channel cross sills. The side sills extend from body corner post to body corner post, where they are bent to form the end sills, and are spliced at the center of the car. Cast-steel platform knees are fastened to the end and side sills and are designed to allow room for the lower step within the platform area. Additional support is given to the platforms by two sills which extend from the end sills to the bumper channel. The double flooring of $1\frac{1}{8}$-in. maple laid on $\frac{3}{8}$-in. yellow pine is fastened to furring attached to the cross sills.

The side posts are of $1\frac{1}{2}$-in. x $1\frac{1}{2}$-in. x $\frac{3}{16}$-in. tees and extend from the side sill angle to the side plate and letter board. These are spaced at 2-ft. $4\frac{1}{2}$-in. centers and are riveted to the side sheet, belt rail and letter board. The inside of the posts is furred to



**Mirrors Mounted on Each Vestibule Ceiling Provide a Means of Supervising Rear Exit. Double-End Operation Requires Two Sets of Mirrors**

The operator, looking into the mirror at his right, sees the rear exit as reflected by the mirror above the rear step.

hold the truss plank, side lining, inside trim and sash and curtain guides.

Carlines of 1½-in. x ⅜-in. steel mounted on edge are bolted to the side plate at each side post. A 7/16-in. poplar roof covered with canvas extends over each vestibule. The car weighs 31,000 lb.

Attractiveness has been attained by streamlines and the use of rich canary yellow paint striped in black. Numbers on the sides and dash and a sign on the dash indicating that the car has a rear exit are the only lettering on the exterior. Eleven windows have been provided on each side of the car body. The lower sash are brass and arranged to raise; the upper sash are of wood and all eleven are framed in one piece. With the narrow side posts and the brass sash, the obstruction to vision has been reduced to a minimum. Window guards, in three sections of 2-in. wire mesh screening, cover the lower sash. The vestibule windows have brass sash. The upper sash in the center and right hand windows of the vestibule contain a route number and destination sign, respectively. On each dash is mounted a headlight, marker light, trolley retriever and "Oskelite" stop light. This latter is mounted to be just below the belt rail under the right window on the rear end.

Two trolley poles and 12 Garland exhaust type ventilators are mounted on the roof.

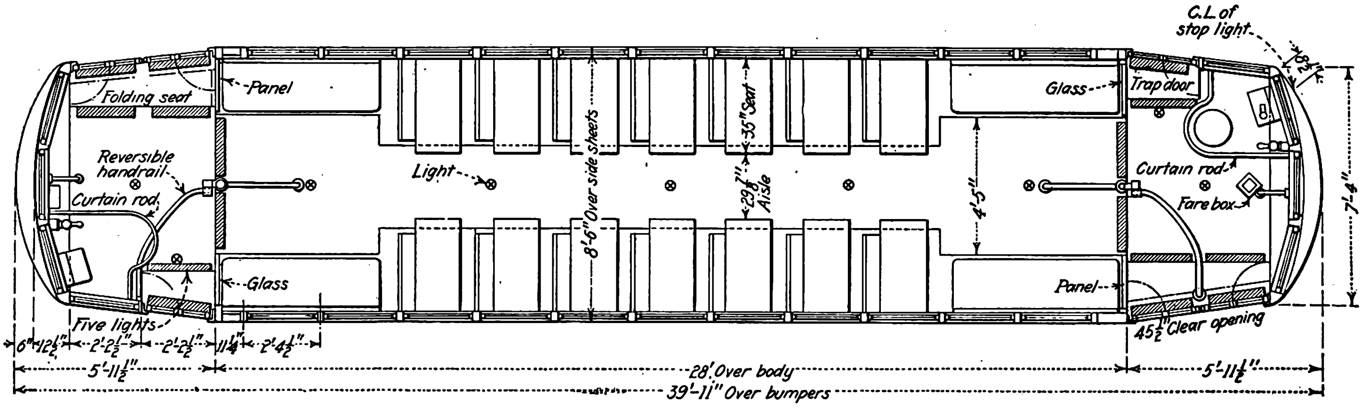
Double folding doors serve as an entrance and exit on the front platform, while a single folding door, adjacent to the body corner post, is used as an exit at the rear. These doors are pneumatically operated by National Pneumatic door engines. Control of the two engines for the forward doors is mechanical. The rear door is controlled by an air valve at the operating or front end of the car. This latter control is interlocked with the motor control circuit. Additional safety is given by an indication lamp at the operating end of the car, which indicates the position of the rear door.

All steps are within the platform area. The step wells are closed by trapdoors when the steps are not to be used. These trapdoors fold back and are fastened to the vestibule side of the bulkhead. Step heights from top of rail to car floor are 14 in., 13 in. and 6 in., giving the floor of the car an elevation of 33 in.

Aluminum stanchions divide the wide step at the forward end of the car and the opening between the vestibule and car body into an entrance and an exit passageway. A curved movable railing connects these two stanchions. At the rear door post is a fixture to receive one end of this railing. In the first position the railing acts as a guide to passengers entering and leaving at the forward end. In the second position it serves as a guide to the rear exit door and also acts as a guard to the rear exit step well. One of these railings is provided at each end of the car and is changed about when the operator changes ends. In addition, a permanent double railing extends from the body stanchion down the center of the car for a distance of 30 in.

Light finish is used throughout the interior of the car body. The white maple floor, rattan seats, birch finished trim and bulkheads and a white enamel headlining give the car a clean, cheerful appearance. Fourteen Hale & Kilburn reversible cross seats and four longitudinal seats give the body a seating capacity of 44. The cross seats have spring cushions and backs and are spaced seven on each side of the car on 2-ft. 4½-in. centers. At each corner of the car body is a longitudinal seat extending along the two end windows. The back of this seat is brought up to the bottom of the window capping. Two brass window guards cover the lower sash of these two windows and serve as a continuation of the seat back. Additional seating facilities are provided on the platform by folding seats which extend along the combined entrance and exit doors. These are hinged to the bulkhead and fold up out of the way when the doors are in use.

Thermostatically controlled electric heat is furnished by a heater under each seat and one on each platform.



**Floor Plan of the New Fort Wayne Double-Truck Cars, Showing Seating Arrangement and Platform Equipment**

Those in the body are of the cross-seat type, suspended from the seats. A deflector pan is placed just above each heater to prevent the warm air from being pocketed under the seat. The thermostat is placed at the center of the car on a side post just below the advertising rack.

The side lining from the truss plank to the belt rail and the headlining are of ¼-in. Agasote. The ceiling closely follows the curvature of the low-arched roof and extends from curtain roller to curtain roller between the bulkheads. The usual advertising racks occupy a portion of the ceiling. The headlining contains the registers for controlling the ventilators, four "Rico" hand straps over each longitudinal seat and five shaded lamps. These are 100-watt lamps with clear glass, holophane shades and are spaced over the aisle. A panel effect has been given to the headlining by the birch cross strips which hold the Agasote in position and by decorating each section.

Each platform has the usual control apparatus and air-brake piping with valve. The three door control levers are mounted on a shaft, one above the other, in such a manner as to be convenient for individual or simultaneous operation. A Cleveland fare box is mounted on a stanchion close to the operator's position at the left forward corner.

In order that the operator may see the rear exit door and step from his seated position, mirrors are mounted in each vestibule. These are 15-in.x15-in. plate glass wood-framed mirrors placed overhead on strap-iron framework fastened to vestibule carlines. One mirror is located above the double step at the forward end of the car, and the other is located above the rear exit. These are set at the proper angle so that the operator in looking to his right into the forward mirror sees the rear step and car aisle as reflected by the mirror at the rear. Thus he gets a clear view of the rear exit even though the car is crowded. Also, a window placed in the left side of the bulkhead allows the operator a direct view of the rear exit if he should so desire.

As an aid to the operator and the passenger, a bank of five lamps has been placed behind clear wired glass in the exit step riser. The lights are controlled by the door-operating mechanism and illuminate the step and adjacent pavement when the door is open.

To call the passenger's attention to the rear exit door a sign has been mounted on the inside of each bulkhead over the aisle. These signs read "Exit at Rear." They are of green glass and are illuminated from behind by two lights which are connected in series with the "Oskelite" stop light on the rear. This circuit is controlled by the power controller. When the power to the motors is cut off the stop light and these signs are illuminated.

Converting the 65 single-truck, double-door cars into the same type of car as the new double-truck cars was simplified because of the same platform size and construction. The single door and step is placed at the rear without changing any of the structural features of the car. The panel was removed and a drop-framed step angle fastened to the end sill and platform knee. The most important change was made in the location of the control circuit conduits. These formerly followed the side sill from the center of the car to the dash. Now they are located about 1 ft. inside the sill in order to clear the step. All of the signs and lamps described as part of the double-door equipment have been made standard for the property and placed in the rebuilt small car as well as in the new double-truck cars.

# The Readers' Forum

## *How One Small Road Gets By*

April 16, 1924.

To the Editors:

Being the operator of a small road, I was particularly interested in the article published in the issue of the ELECTRIC RAILWAY JOURNAL for Feb. 23 entitled "Saving the Small Road." Even Mr. Crawford's property is about four times as large as the one with which I am connected, so naturally I have been forced to adopt different methods to keep the wheels turning. At the risk of appearing ridiculous I will mention a few of them.

This property is in a Southern agricultural town of about 20,000 people, more than half of them black. Our problem, however, is not with the black people, as they are better car riders than the whites. The real problem is with the generous automobile owners, who in several cases that have come to my notice are always willing to furnish free transportation to any acquaintance, be it ever so slight.

We operate about 8 miles of track originally laid with 45-lb. T-rail on long-leaf heart pine ties spaced on 2-ft. centers. Quite a little of this has been relaid and paved too. But paved streets in a small town are only speedways for the automobile owner, and, as such, work a hardship on the small car line, when it must pay for the very thing that cuts its throat. Part of our track in paved streets is laid on Carnegie steel ties and part of it is laid on ties made of old T-rail cut and drilled to bolt to the track rails. We find that they make very good ties, the bottom bearing surface being larger than some steel ties on the market today.

Naturally we cannot buy the latest thing in cars or equipment and must furnish service with motors, trucks, etc., of rather ancient vintage. Frequently the writer has heard the old Westinghouse 12-A maligned by the more up-to-date operator, who really did not know what a good motor it was, unless he had been placed in our position of having to make it do anyhow.

Armature bearings on every car are inspected once a week. Axle bearings are replaced as needed. Owing to the sandy top soil in a large part of the town, and with old style motors, whose axle bearings are not protected from dust and mud, it is very hard to prevent excessive wear. We have no wheel grinder, but the writer has rigged up one that does very good work, so that we grind out all small flats as soon as we find them.

This being a one-man road, the writer is general factotum, doing anything that is necessary, including winding armatures, machine work, office work, and looking after the whole property generally. We only have two and one-half men employed for every car we run, including car operators, shop force, track force, supervision and all others connected with the road, even the attendant for the converter station. The substation man only works half of each day, being able to find enough odd jobs around town to take up the rest of his time.

This is one of the very few roads in the country that are enabled to make a few extra dollars by handling the baggage, scenery, etc., for theatrical people to and from the theater. Another item of revenue is handling the material needed in paving the streets used by the street cars. We have physical connections with all the steam roads entering the city and are enabled to get quite a little business this way. For instance, a large hospital was built at the end of one of our lines. We hauled over our track in the steam road cars all the material used in the building, amounting to 125 carloads.

Some of the curves on this line were of 65-ft. radius. In handling these cars, which the writer did himself, it was found that only three of the steam road cars would not take the curves on this line. Frequently we found the steam road cars down on the side bearings, so that before we could attempt to move them we would have to jack them up and shim the center bearing up to clear the side bearings. We have had very few derailments with this heavy equipment, but find careful inspection is the answer to that problem.

We have one car that does nothing but meet trains. Owing to favorable train schedules we are enabled to meet every train that arrives in the city. There are fourteen passenger trains arriving and fourteen departing every day. After 8 p.m. this one car charges 10 cents for this service. It is readily appreciated by the traveling public.

We are careful to keep our aims before the public, using our own cars, picture-show screens and newspaper space to do this.

We find that a street railway must depend on only one thing for its existence in a community, and that is service. Serve the public and impress on them that your cars are on time all the time and they will ride with you, unless there are too many free automobiles to contend with. But don't attempt to fight the automobile owner—just keep your own affairs in shape and your car wheels turning all the time.

SUPERINTENDENT.

# Association News & Discussions

## Service as the Basis of Public Relations

### Railway Men of Southwestern Public Service Association at Fourth Annual Convention Discuss Methods of Securing Public Good Will—Way Matters, Shop Practice, and Accounting Were the Subjects of Separate Meetings

THE importance of giving good service and advertising it, as seen from the viewpoint of the transportation, mechanical and publicity departments, was strongly emphasized at the sessions of the street and interurban railway section of the Southwestern Public Service Association during the joint convention with the Southwestern division of the N. E. L. A. at New Orleans, La., April 22-25.

The keynote on the subject of service was struck at the meeting on Wednesday afternoon by A. B. Paterson, vice-president New Orleans Public Service, Inc., who spoke on the importance of careful selection and training of trainmen, and of keeping up the physical condition of the railway because of the bearing of these things on public relations.

The education and development of employees so that they have a thorough understanding of the railway business was urged by W. E. Wood, manager Houston Electric Company. The public has a right to know the facts concerning any utility company, according to Mr. Wood, and the employees certainly have an equal right to this information. They must understand what the company is trying to do and the methods that are being followed to accomplish the desired end. They are then in a position not only to do their own work better but also to inform the public as to how the company is working to give good service. Regular monthly conferences are the means used by the Houston Electric Company to bring the officials and employees together for the purpose of furthering this work.

Ways of telling the public about the efforts of the railway to give good service were discussed at a joint meeting of the public relations and transportation sections on Thursday afternoon. C. J. Crampton, Dallas Railway, told how that company had popularized the slogan "Ride the street car and save the difference." Five media are used for advertising. In newspaper advertisements a full page once in a while has been found to be more effective than smaller space used more frequently. An effort is made to place the railway advertising on days when other advertisements are comparatively scarce. That gives it more prominence and also gratifies the newspapers. Interior bulkhead cards, dash signs and dodgers in the cars are used. It is the practice of the Dallas Railway to change the bulkhead card at one end of the car one week and at the other end the next week, thus leaving each card in the rack for two weeks.

Billboard advertising, although not widely used by electric railways, is thought by Mr. Crampton to be very valuable. It is especially worth while in connection with track construction work to tell the public how much the job is costing, etc. Miscellaneous advertising in theater programs, booklets and the like is used somewhat at Dallas. The most important medium, however, is the personal touch contributed by the employees of the railway in their contact with the public.

In the discussion that followed, Mr. Grant, Houston Electric Company, brought out the point that service must be the basis of good public relations. W. H. Sawyer, president East St. Louis & Suburban Railway, explained the methods which he had followed to secure newspaper co-operation. An important point in the advertising policy of this railway is the display on a bulletin board in the carhouse of every advertisement published in the newspapers. This shows the men what the company is trying to do and encourages them to do it.

The Dallas Railway always sends full reports of accidents to the newspapers, Mr. Crampton said during the discussion. W. E. Wood outlined the participation of the Houston Electric Company in all civic affairs and spoke of the success that had attended the efforts of the company to swing public opinion to a more favorable position.

Good service as the master mechanic sees it, was the subject of a paper presented on Friday morning by R. M. O'Brien, superintendent of equipment New Orleans Public Service, Inc. He told something of the routine and inspection and repair methods followed by the mechanical department which have helped in reducing the number of car pull-ins in the last 3½ years from one per 1,380 miles to one per 217,728 miles in March, 1924. This will be given fuller treatment in an article prepared for an early issue of this paper. At the same meeting an address on the relation of bus operation to street railways and the outlook for the future, which was prepared by W. B. Tuttle, was read by J. P. Griffin, vice-president Texas Electric Railway, on account of the illness of Mr. Tuttle. This appears elsewhere. L. C. Singleton, claim agent

Eastern Texas Electric Company, read a discussion on accident prevention that had been prepared by W. A. Robertson, superintendent of railways, who was unable to be present.

At separate sessions on Thursday afternoon the mechanical, maintenance of way, and accounting divisions discussed their special problems. A discussion on the use of electric and acetylene welding in shops was led by Walter Silvus, superintendent of equipment Texas Electric Railway, Dallas. J. T. Porter, master mechanic Northern Texas Traction Company, Fort Worth, led a discussion on shop organization and maintenance practice. F. J. Bennett, master mechanic Houston Electric Company, led a discussion on the wear of carbon brushes in ventilated motors.

R. J. Tabor, Northern Texas Traction Company, Fort Worth, led a discussion on the cost of various types of paving. He said that from 7 to 10 per cent of the six billion dollar investment in electric railway properties is in paving. He pointed to this as a reason why this item of the railway plant should receive more study and attention. It is time for the industry to combine its efforts to correct some of the sad experience that has resulted from use of paving unsuited for the conditions and because too many railway engineers are ready to accept the specifications of the city engineer. He emphasized the fact that paving should be designed primarily to carry vehicular traffic.

He pointed out also that 45 companies have been granted relief from paving burdens in recent franchises and predicted that this policy will eventually spread over the entire country; but even if it does, the railway engineer will still have great responsibility in seeing to it that a proper design of paving is installed, not only as a protection to the railway, but as a matter of civic betterment. He said that his company had recently gone to the use of concrete paving as the best practice.

R. B. Fehr, Rail Welding & Bonding Company, Cleveland, presented a paper of seam welded joints which will be treated in a later issue. Creosoting and other methods of preserving ties and poles was discussed by J. P. Logan, National Lumber & Creosoting Company. Cast steel and alloy steel vs. manganese for special trackwork was treated by E. B. Entwisle, Lorain Steel Company, and James H. Budd, Bethlehem Steel Company. Mr. Budd's paper appears elsewhere in this issue and that by Mr. Entwisle will be covered in a later issue. B. H. Taylor, Houston Electric company, led a discussion on the foundation and paving of crossings.

At a meeting of the accountants, R. E. Loup, Northern Texas Traction Company, Fort Worth, discussed the use of machines in accounting work. A. D. Dufour, New Orleans Public Service, Inc., discussed the subject of transportation department payroll accounting.

### OBTAINING CAR MILEAGE

The methods used by the Dallas Railway in obtaining and recording car mileage were described by N. R. Burns, assistant secretary-treasurer of the company. The principal features of the system are as follows:

(1) The mileage on each schedule, by runs, is determined before the schedule becomes effective; (2) each conductor or operator is furnished a set of mileage cards to enable him properly to prepare his trip sheet; (3) space is provided on the trip sheet for showing mileage by trips, and the total for the run; (4) the actual mileage operated is reconciled with the schedule mileage; (5) by the use of a series of forms the mileage of each car and the total mileage on each line are recorded daily.

Sheets which show the passenger car mileage scheduled for each line each day are provided for (1) Sunday (2) Saturday and (3) other week days. The mileage sheets are prepared by the traffic department and checked by the accounting department before the schedule is put into effect. Copies are posted at the carhouses so that each conductor may know before going out on his run the amount of mileage in the run provided it is operated completely.

Each conductor is furnished with mileage cards which show the distances between various switches, turnouts, termini and other points on the line where a car might turn back. Blank spaces are provided on the trip sheet for showing "schedule miles" and "miles operated." As the conductor completes his trips he fills these from information on the mileage cards. At the end of his run he totals up the trip mileage. If the miles operated do not agree with the "schedule miles," the conductor explains the difference on the back of the trip sheet.

Early each morning the trip sheets for the day before are sent to the accounting department, where the mileage clerk adds the mileage shown on the trip sheets on each line, and checks it against the scheduled mileage, making allowance for variations from the schedule as reported by the conductors. The corrected mileage for each line is entered on a daily summary sheet, from which it later is transcribed to a monthly summary. A recapitulation of the monthly line totals gives the total passenger car-miles operated during the month.

The daily mileage of each car is transcribed from the various trip sheets to a form on which the numbers of all cars appear. This is forwarded to the office of the master mechanic, where the information is transcribed to individual mileage cards, which show the operations of each car for one year. From the information appearing on these cards, the master mechanic is able to maintain proper control of the inspection of the cars.

Non-revenue mileage, which includes service cars, "pull-ins," etc., is kept by the maintenance of way and mechanical departments. It is of relatively little importance, as it represents only about two-tenths of 1 per cent of the total mileage operated by the company's cars.

Among the papers presented at the general sessions were three by J. W. Welsh, W. H. Sawyer, and E. F. Wickwire, which appear elsewhere in this issue.

An attendance of more than 500 was recorded for the joint convention, about a third of whom were railway men. Among the social events were the annual reception and ball on Tuesday evening, complimentary to the associations by the supply men's division; a dinner-dance on Wednesday evening, and an "Old Plantation Night" at Spanish Fort on Thursday evening. A trip around the harbor was made on Friday afternoon. Card parties and luncheons for the ladies took place during the four days.

At the conclusion of the sessions of the railway section a vote of thanks was extended to the New Orleans Public Service, Inc., for its efforts in making the convention so successful. W. E. Wood, manager Houston Electric Company, was unanimously elected chairman of the street and interurban railway section for the coming year.

# Training the Supervisory Force*

By W. W. Holden

Superintendent Transportation and Equipment San Antonio Public Service Company

STREET railway inspectors are up against a real man-sized job and in most instances are given very little instruction and assistance in handling it so as to get the best results. The inspectors are in so much more intimate contact with the trainmen that they can do more than any others of the supervisory forces toward improving the service that is given.

The manufacturers of power-saving devices started a new line of thought when they recommended a special inspector to follow up the power-saving work. Each street railway that has adopted some method of power saving has placed some one especially in charge, whose duties have been to compile data on power saving, to investigate methods by which power saving may be improved, to instruct the inspectors in these methods and to inform the inspectors as to which of the trainmen are especially in need of such instruction.

Following up this idea, the San Antonio Public Service Company has tried out the plan of having several other special inspectors to make similar studies of other phases of street railway operation.

While it is not new to street railway men to make a study of safety work, it is perhaps new to have one of the inspectors in charge of it. It is believed that an inspector who naturally is intimately acquainted with operating conditions is well prepared to study accidents and to lead in safety work. Whenever possible, the safety inspector visits the scene of each accident, measures up the marks on the pavement, the distance from the curb lines, and scratches on the automobile and street car. These are all reported to the claim department as well as the superintendent of transportation. In the case of derailments, the track, the car wheels and the marks of the derailment are all examined and the mechanical and track department given a copy of the report. A monthly analysis of the accidents is made and given the inspectors. A daily detailed report of accidents and an accident map showing the classification and location of accidents is kept posted for the inspectors and trainmen. About twice a week a cartoon on accident prevention is prepared and posted for trainmen and inspectors.

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*Abstract of a paper before the Southwestern Public Service Association, New Orleans, April 22-25, 1924.

### INSTRUCTION IS A CONTINUING PROCESS

It is believed that no street car man knows all there is about running street cars and that none of the trainmen should pass entirely out of the jurisdiction of the chief instructor, although most of his work is that of instructing new men. Any man failing to put up his car properly or to cut out motors at the right time is referred to the chief instructor. He also investigates cases where a trainman requests a "pull-in." Frequently a "pull-in" request is made when the car is in good condition, but the trainman does not understand some apparent trouble. Also it frequently occurs that a car is in bad order, but the shop tests will not indicate the true condition. When this is properly explained to them by the chief instructor, necessary repairs can be made and further pull-ins for a misunderstood trouble prevented. His study has assisted the mechanical department in its campaign to reduce pull-ins.

One inspector has been assigned to the improvement of fare collection and accounting by conductors. He follows up trip sheet errors and turn-in errors made by the conductors and instructs them in the proper way to do this work. We stole a page from Mr. Plummer's book in Dallas and started a "Penny Man Bulletin" under the direction of the conductor inspector, who also has charge of the rest of the secret checking work.

One inspector has been assigned to the checking of delays. Where a car is late enough to turn back or the line gets a setback it is reported by the dispatcher. The delay inspector follows these up. Where one man or one trip is frequently the cause of delays, the delay inspector tries to get at the cause and to take the necessary steps for correction. He also checks watches to see if all men have provided themselves with suitable watches.

The chief inspector has charge of the road inspectors, and they are divided into three teams. Two teams have charge of the inspection on one-half of the lines each and the third team is used as reserve and for general inspection. The chief inspector instructs the road inspectors as to the proper method of handling cases of delay.

At each of the weekly inspectors' meetings one man presents a paper on some subject regarding street car operation. The idea back of this plan is to have the inspectors instruct each other, and by having specialists in certain lines they become better qualified to instruct along the lines on which they have specialized. Part of the work of specializing includes trips to other cities to study their methods and to broaden the viewpoints of the inspectors.

A lot of statistics could be produced to show the results of this method of arranging inspectors' work, but I will only say that the results have been unbelievably good. Delays were reduced from 1,228 in March, 1923, to 823 in March, 1924. We feel sure that we have only started to reap the benefits of this specialization and expect to show some real results after it has been in operation for a year or so more.

# Why Car Fares Differ*

BY JAMES W. WELSH

Executive Secretary American Electric Railway Association, New York

WHY does Boston have a 10-cent fare, Cincinnati a 9-cent fare, Washington an 8-cent fare, New Orleans a 7-cent fare, Minneapolis and St. Paul a 6-cent fare and Los Angeles still the original 5-cent fare? With this range in fares you are all familiar, but these are only a few of the actual differences that exist. There are 650 cities and towns in the United States in which electric railways operate. Conditions differ in all of them, and it is the purpose of this discussion to show you why in each there is a different rate for service.

Comparisons of city street car fares are frequently made, especially by politicians who seek to discredit the rate in one locality by quoting a lower rate elsewhere. The fact that some other city has a lower fare is put forth as conclusive proof that the local fare is too high. Not that there is any serious contention that street car fares ought to be equal in all cities, but that in the city of so and so the company is making money on a 5-cent fare. Why should the people of the local city be inflicted with a higher fare? Now you see this argument very cleverly assumes that a car ride is the same, whether in Kalamazoo or New York City. To the average person who has troubles of his own, without bothering about the street car company's problems, this looks plausible enough. To you electric railway officials and public utility experts, just to state such a proposition is to indicate its absurdity. You know that not only is there a wide variation in the cost of what the company has to buy in producing a car ride, but that there is even a greater divergence in what the company offers in the form of a car ride, i.e., the service furnished, which varies both in quantity and quality, reflecting the utmost difference in local conditions.

Now while the man on the street may vaguely realize, if he stops to think about the matter at all, that costs of labor and material vary somewhat in different places, this is about the extent of his knowledge, and it doesn't begin to explain to him the existing great variations in fares.

### RAILWAY MEN SPEAK AN UNKNOWN LANGUAGE

You gentlemen who are running this business know what are the elements in the cost of a car ride. You think of wages and working conditions; maintenance and depreciation; cost of power, materials and supplies; taxes and other imposts. These things have a familiar sound and to you convey some idea of the significant factors that vitally affect fares. This is an unknown language, however, to the average car rider. He just simply doesn't know the meaning of such terms as car-miles, load factor, headways, peak loads, riding habit. Now if these things are essential to an understanding of why car fares are not the same, how are you going to explain them? Some may ask "Why explain anything? We have no agitation about fares; why stir the matter up?" Experience has demonstrated that sooner or later, and more or less frequently, every company will have to defend its fare schedules before the public. When it does it will find opposition or intelligent consideration in proportion to the degree of understanding that exists as to its problems.

The ascertainment of a just rate of fare is such a technical matter that it cannot be done quickly, even by experts. The public rarely understands the matter, and there is always the danger that it will think the company is trying to put something over. A receptive attitude of mind on the part of the people is much more likely to exist if there has been adequate preparation.

In Cleveland when the service-at-cost franchise was being considered in 1910 every man, woman and child became an interested student of the street car problem; they attended mass meetings and heard the questions explained almost nightly, and the papers were full of the story continually.

Not only is it an advantage to keep before the public the facts about local fares from a favorable viewpoint, but the simplest possible language should be used in explaining them. The more elementary the form in which this is put the greater are the chances of its being understood by the average car rider. I have endeavored to do this in the following:

### FIVE FACTORS AFFECT FARES

Let us consider five factors only which affect fares; there are others, some of which in certain places are important, but for the purposes of illustration these five will do. They are: Speed; wages; length of haul; density, and investment.

### FIRST, SPEED

How does speed affect fares? If you increase the speed; that is, make the cars run faster, they will complete their trips in less time. If the car completes its trip in less time it will be ready to start its next trip sooner than otherwise, and thus will take the place of some other car that otherwise would be required. Increasing the speed, therefore, permits the same service to be performed with fewer cars. Fewer cars mean fewer men to operate them. It means smaller carhouse space to store them at night, less shop facilities and fewer tools, fewer men to keep them repaired. Thus increasing the speed reduces the investment in cars, carhouses, shops and tools, and reduces the number of trainmen and shopmen to operate them. Hence speed is the very essence of transportation. In one city with wide and level streets, where traffic regulations are enforced by highly co-operative city officials, the cars have an average schedule speed of 12 m.p.h. In another where traffic conditions are far from ideal the speed is as low as 6 m.p.h. Traffic congestion places a limit on speed, and thus many a community handicaps its fares and its service.

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*Abstract of a paper before the Southwestern Public Service Association, New Orleans, April 22-25, 1924.

### THE SECOND FACTOR IS WAGES

Electric railways employ approximately five men for every car operated throughout the day. Remember, there are two shifts of men, one for the morning and one for the evening rush hour, and besides there are the men employed in the carhouses, shops and offices, on the track and in the power houses. Taking account of all this, 46 cents out of every dollar collected, or approximately half the car fare, goes to labor. Conditions differ widely in different parts of the country as regards cost of living and other elements that influence wage rates, and as a result this factor varies considerably. The prevailing rate for labor in each locality is usually the determining influence, so here again a factor that depends upon conditions within the community has a great bearing on the rate of fare.

### THE THIRD IS LENGTH OF HAUL

Length of haul does not mean the longest ride a person can possibly take for a single fare. A wealthy banker of Yonkers rides down town each day on the subway to Wall Street, a distance of 14 miles, for a nickel and boasts about it. Mr. Hedley doesn't like it and says it costs the company 15 cents or 20 cents for such a ride. Obviously if everybody rode this far the company could not meet expenses. But for every such long rider there are several short riders who bring down the average. One will pay 5 cents and ride from Brooklyn to downtown New York; he gets off and his space (you will note I did not say his seat) is taken by another who rides to Times Square; here he is replaced by a third cash customer, and again at Ninety-sixth Street another interchange occurs. From this point outward the pressure gradually diminishes.

The same space in the car is thus sold to three or four persons each paying a 5-cent fare, the result to the company being the same as though one person had ridden the entire trip and paid a 15-cent or 20-cent fare. The greatest length of any one ride on the New York subway is 26 miles, but the actual average length of ride is 6 miles. On the surface lines in New York the longest route is 12 miles, but the average length of ride each passenger takes is 2 miles. In other words, on the surface lines it is possible for the company to sell the space in its cars six times on each trip, and this is the same as though each passenger rode all the way and paid a 30-cent fare. Incidentally in New York the actual cost of service on the rapid transit lines is 7.31 cents, the taxpayers and investors losing the difference above the 5-cent rate.

The maximum possible ride either with or without a transfer is therefore a matter of no significance whatever as a measure of a company's service. Yet frequently the statement is made that a person can ride for 25 miles in New York or Chicago for one fare, and this is put forth as an argument of the superior service in these places. The length of haul, however, or the average distance each person actually rides, is a most significant factor. For if the haul is short even though the route be long, the same space in the car may be sold several times over.

### DENSITY IS THE FOURTH FACTOR

By density is meant the greatest possible use of all the facilities and service furnished. It means the carrying of the most passengers with the fewest cars, miles of track, etc. It doesn't necessarily mean overcrowded cars, for high density can be secured by an even distribution of normal loads. Density touches the very heart of the transportation problem. It embraces the fitting of all of a company's service and facilities to the demands of traffic.

To start with, density determines whether there should be a double track or a single track; density determines whether tracks should be laid upon parallel streets a block apart or six blocks apart; density decides whether cars should be run every minute or every ten minutes. Density dictates the economical size of cars, whether of 30-seat capacity or 60-seat capacity, and whether or not cars should be run in trains or with trailers; also whether cars can be run economically all day long in 18-hour service, or whether there are just a couple of hours each day in the rush hours for which cars, men and power must be kept in reserve but without income. Density will be high if cars run in both directions of traffic equally well loaded, instead of loaded in one direction and empty in the other.

Briefly, the effect of these elements on fares is as follows:

If rails are laid on one street only through a community, the investment in track will be less than if rail lines are installed in several parallel streets to serve the same district. In either case approximately the same total number of passengers may be carried, but if the tracks are laid on several streets, a wider area and greater population may be more conveniently served. Here is opportunity for wide variation in practice. American cities have always provided twice as much trackage for a given population as do foreign cities.

Again, large cars and trailers will carry a great many more passengers per trip at a relatively slight increase in cost over small cars. Hence if the traffic justifies the large cars, this cost can be divided among many more people than with the small cars.

### RUSH-HOUR SERVICE COSTLY

In the same way, if there is a steady traffic all day long, then the cost of cars, labor, maintenance and power can be divided up among the large number of people who have used the cars during the 18-hour service. For those cars for which the traffic justifies operation only a few hours in the rush period, almost these same total costs will have to be met, since men must be paid a day's wage in any event and extra power and shop facilities must be provided for the cars operated during the morning and evening rush hours. Since approximately the same costs are divided among a few passengers in the latter case, the cost per passenger will be several times as high as for the 18-hour cars. In most cities about half the cars lie idle during the day, being used only during the rush hours.

In Detroit, where large numbers are employed at the automobile factories on the three-shift-in-24-hour plan, the cars carry loads in both directions. The same car that brings one shift to the factory takes another shift home. In those communities having one central business district and outlying residential areas the cars carry loads usually in but one direction, i.e., toward the business district in the morning rush hour, and run empty in the opposite direction. Where a number of smaller business centers with intermediate factory and residential districts exist, there is usually traffic in both directions, frequently during the greater part of the day. Such conditions are favorable to short haul and high density of passenger traffic. The two factors, length of haul and density, when combined measure the degree of usage made of the service. Together they determine the amount of service constituting a car ride for each community.

### A ONE-CENT CAR LINE

In Cleveland several years ago much publicity was given to a one-cent fare that prevailed on one route running from the Municipal Pier to the Public Square. The explanation was the short haul. The line was purely an experiment and was abandoned as representing an unsound principle. It shows what would happen, however, if fares were fixed separately for each route. In a system of any size equally great variations between routes will be found as now occur between cities.

I have taken several typical cities as illustrations of this and have determined the total cost of the service furnished on each of its routes. I have assumed that this cost should be divided equally among the riders actually using each route and that the result is the fare they might properly be asked to pay. In other words, each route is made to stand by itself and the fare is fixed by the traffic it carries.

In a city of over 700,000 population where the average fare is approximately 7 cents, the rates on one route would be 5 cents and on another 12 cents. In a similar city the rates on individual routes would vary from 4 cents to 24 cents. In several small cities of less than 100,000 population where the average fare is approximately 7 cents the individual route fares would vary from 5 cents to 14 cents. In two cities of approximately 2,000,000 population each, which I have taken as an example at the other extreme, the individual route fares would vary from 4 cents to 28 cents.

Variations such as these in the necessary rates of fare to meet the cost of service between individual routes illustrate the folly of the bus advocate who concludes from the successful operation of some favored motor route at a low fare that service could be provided to all parts of the system at an equally low fare. Most communities have decided that there should be a uniform rate of fare applicable on all routes and that, rather than abandon operation on the more costly routes, sound public policy demands that their increased cost over the average of the system should be borne by the more profitable routes.

### THE FIFTH AND FINAL FACTOR—INVESTMENT

The reason for including investment as the fifth factor is not so much because of its importance in influencing the rate of fare as that this is the reason chiefly advanced by the politician as the cause of high fares under the name of "overcapitalization" or "watered stock."

On the average, from one-fifth to one-fourth of the car fare goes to pay the interest on the investment. This is a higher percentage of the cost of service than is required in many other industries. The reason is that the investment in electric railways is much higher in proportion to the receipts than in other businesses. For every dollar the electric railway receives in fares the investment in cars, track, shops and power is at the very least $5 or $6.

For every dollar received in sales by the merchant, on the other hand, his investment rarely exceeds $1 and frequently is only half or a quarter of a dollar. A very small portion, therefore, of the merchant's dollar will pay a good rate of interest on his low investment, while it takes a much higher percentage of the electric railway dollar to pay even a small return on its high investment.

Assuming, for argument, some electric railway company should be overcapitalized 100 per cent and that it is now paying an adequate return on twice the actual investment, letting out the water would decrease the fare 10 per cent on the basis of national average or ¾ cent per passenger. This is the same amount, or portion, of the rider's fare that now goes to pay taxes and other imposts such as paving, etc. Investment, therefore, is one of the least of the factors affecting the rate of fare.

Summarizing, any one alone of the four factors—speed, wages, length of haul and density—could more than account for existing variations in fare. Combine them, and the wonder is not that fares range only from 5 to 10 cents but that they do not reach far wider limits.

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# Attracting Good Men to the Industry*

## Railways Should Have Enough Competent Talent to Give Responsible Department Heads Time to Think and to Study Better Practices and to Co-operate in Industry Activities—Better Pay an Essential

By W. H. SAWYER
President East St. Louis & Suburban Railway

FEW appreciate the importance of the responsibility of the public utility executive and his assistants. Take, for instance, the New Orleans property, which is valued at approximately $55,000,000. Fifty-five million dollars is a lot of money. Look over the capitalization of the different banks in this city. I venture the statement without even checking it that all of them put together have not a capitalization of $55,000,000. With this comparison you will commence to get an appreciation of the magnitude of the job which devolves upon the executive of such a corporation, and particularly of the responsibilities when viewed in connection with the complexities of electric railway operation.

There are very few, if any of us, who have the amount of direct assistance that we should have to carry forward such gigantic propositions. Our associates are, generally speaking, not paid in accordance with the importance or responsibility of their work. Follow on down the line. Take our maintenance of way engineer and our master mechanic as typical examples. Stop for a moment and figure out how much money is spent under the direction of each of these two men and then note what their salaries are, and particularly note what little technical assistance they have in the efficient expenditure of this money. Neither the bankers nor the public have ever fully appreciated either the magnitude or the intricacies of electric railway operation, and I might add that I do not believe that we executives have fully appreciated that it is our duty to surround ourselves with more men, better men and better paid men than has been the rule in the electric railway industry.

If you will take the total salaries paid to all officials and sub-officials of the average electric railway and then take the amount of money expended under the direction of these officials and compare it with other business—business not as complex as the electric railway business—you will find that the amount spent in the electric railway industry toward this supervision, toward bringing about better efficiencies, is absurdly small. We all want to do the things which should be done and we have all felt the handicap under which we were continually working, but if we are to do the job in the way we really know it should be done we must make fair comparisons with other business and look the matter fair and square in the face.

This thought came to my mind in connection with my seeking ways to bring about more active co-operation with the American Electric Railway Association. There should be enough men on a property so that a portion of their time can be devoted to the education which comes about from contact with outside organizations. We all stay too much in our own town because we have not the time to get over to the neighboring town to find out what our neighbor is doing. All wrong. We must have enough help and assistance so we will have time to find out what our neighbor is doing, and then we can take advantage of the experience of his neighbor and make changes and improvements due to information acquired through this personal contact.

Today many of us have not the time to take care of our important work right at home. We know that if we were able to work the whole twenty-four hours we could do a far better job than we are doing today. That being a fact, why should we not surround ourselves with enough capable men who are paid salaries commensurate with their responsibility, so that the important work can be done each day?

Once we fully appreciate the responsibility resting on us we will attract to the industry a more highly skilled type of man than has been attracted of late years. Many bright engineers with a real liking for electric railway work have gone to other fields, and the reason has been, not altogether the fact that we did not pay them enough, although this has been an important factor, but that we did not give them the opportunity to broaden and better themselves, such as bright men desire. In order to broaden himself a young man must have some time for study and some time to analyze. He cannot do his best work if he is continually goaded by the necessity of keeping the wheels turning.

### MODERNIZE AND MERCHANDIZE

The electric railway man has always been ambidextrous; he has always been efficient, but there is unquestionably an opportunity for us to be even more efficient. During the period preceding the war and during the war we left undone any number of things which efficiency demanded should be done. The mere fact that the efficiency produced would pay for the improvement was altogether secondary when we did not have the money to spend, but generally speaking, money is today available when needed for proper expenditures for better efficiency.

The manufacturer tells us today that there are too many obsolete tools around our car shops; that there are too many obsolete motors under our cars; that there is entirely too much obsolete machinery and apparatus scattered over our properties. I believe the manufacturer is right. I believe that we must recognize that we are a going concern, that we will continue to be a going concern and that we must put and keep our house in order, so that, taking into account fixed charges and operating expenses, and looking at it from every angle, we can show that our properties are operated as efficiently as is practicable.

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We have, however, only started toward our duty when we surround ourselves with enough able associates and when we have efficient machinery and apparatus with which to work. Our first though must be to satisfy our customers. That may be a trite saying, but I use it because it means just what I want to say. The 1924 executive really wants to satisfy his customers; we all want to give the kind of service that our customers want us to give, but even today none of us is doing too good a job along this line.

Our customers are rightfully entitled to satisfactory operating service and to publicity service. They have a right to know all the facts concerning our business. Moreover, we have a duty to our customers and to our potential customers to sell our service to them. There are many ways of giving this publicity service, but the best way is by newspaper advertising. Other business gives its customers facts and information. Other business seeks through newspaper advertising to sell its products and its service, and to my mind there is no more important department in the 1924 electric railway company than its advertising department. I thoroughly believe in newspaper advertising in the electric railway business and I know of no electric railway company which cannot afford to do more, rather than less, newspaper advertising.

### INDIRECT TAXES NEED ATTENTION OF RAILWAY EXECUTIVES

Assuming that the electric railway executive has his enlarged and more efficient organization, has put into effect increased efficiencies of operation, has co-ordinated bus service with electric car service, is advertising in the newspapers and is, within reason, really satisfying his customers as to service, he has in many cities still another important duty. That is to co-operate with his car riders toward a reduction in car fare, assuming, as I said, that the service has been brought up to a satisfactory standard, for to my mind satisfactory service is practically always more important than a lower rate of fare.

The underlying basis of regulation today is that the car rider must pay the actual cost of the car ride, and no more, the cost of the car ride including, of course, the cost of money. The car rider naturally desires as low a rate of fare as is compatible with good service. One expense which the car rider is paying today which adds to the cost of the car ride but is not a proper portion of the expense of the car ride is the amount paid for indirect taxes, taxes which other business is not called upon to pay.

The general figures available for New Orleans show that these indirect taxes paid by the street car rider amount to more than $700,000 a year. The records show that the New Orleans Public Service, Inc., carried approximately 107,000,000 passengers in 1923. You will thus note that out of the 7-cent fare at least two-thirds of a cent was for indirect taxes. New Orleans has, I believe, something like 400,000 population. The amount paid in indirect taxes would, if paid direct to the community, give every man, woman and child in the community nearly $2 per year. I assume that the car rider would just as soon have this money paid out in paving and other indirect taxes as to have it distributed pro rata among the people of the community, but the important point is that the car rider should not pay out for the benefit of the community at large any such amount as $700,000 a year over and above regular taxes. In most of the newer franchises these indirect taxes are largely eliminated, and rightfully so, because in order that an electric railway may be of the greatest benefit to the community it should give the best service possible at the lowest fare practicable, and this means the elimination of all such unnecessary expense. The indirect taxes referred to do not make for better service, and I venture the prediction that the day will come when all such indirect taxes will be very largely eliminated.

The important point to the electric railway executive is that among his many duties to his customers is his duty of informing them of the amount of these indirect taxes. The car rider is entitled to this information, and further, he is entitled to the unstinted co-operation of the electric railway company in bringing about the elimination of these indirect taxes. If, as is true in some cases, the car rider is not at the present time paying the fair cost of the car ride, including the cost of money, the company is entitled to the elimination of these indirect taxes in order that it may make a fair return, for no business can continue properly to function for the benefit of its customers unless that business receives a fair return.

# "Friendlyizing" the Public*

## Another Wickwire Contribution to the Industry Thinking on Public Relations Work—The Utilities Would Be Poor Picking for Pilferers if All Directly Interested Would Do Their Part

BY E. F. WICKWIRE
Vice-President Ohio Brass Company, Mansfield, Ohio

THE industry is recognizing more and more the fact that favorable statistics follow favorable public opinion as surely as the tail pursues the dog. Service is the foundation upon which we must build the structure of public good will, by making a vigorous, intelligent and intensive effort along sales and educational lines.

There never was an article made that was good enough successfully to sell itself to the public, and the "commodity" known as utility service is no exception to that rule. "Performance plus publicity" is an excellent slogan for the utility industry. But the utility which expects publicity alone to remedy all its ailments is expecting too much. Publicity unsupported is like the whistle on a peanut stand — it makes a lot of noise, but it doesn't roast any peanuts.

However, when publicity is backed by an efficient service, and these two elements are tied together and reinforced by a strong sales effort on the part of the entire utility organization, satisfactory public relations are pretty sure to follow.

The utility can well afford to "tune up" every employee who comes in contact with the public to a realization of the fact that they are more than ticket sellers, or inspectors or platform men—that every time they meet a customer there is a chance to cement a friendship for the company, and much to be gained by always remembering that "A soft answer turneth away wrath."

By sales effort I am not only referring to the business of selling power, light, heat and transportation to the public, but also to that more intangible and more difficult task, which, for want of a better name, I will term "sales promotion." Or, we might coin a word and call the process "friendlyizing," or "utilityizing" your customer—the public. In other words, the successful utility must not only sell its service, but it must sell itself to the public.

This point is of vital importance to us because the very nature of the utility business seems to lay it open to the mistrust of a suspicious public. A mistrust which has been carefully nurture by the prevaricating political pollywog (who is such a liar that he has to get somebody else to call his dog when he wants to feed him), aided and abetted by his ally, the inflammatory nuisance newspaper, and applauded by the radical element generally.

It is this element which is continually trying to instill suspicion into the minds of the public in respect to the utilities; and, as Northcliffe once said, "You can't disarm the nations until you have disarmed suspicion." Why does the trusting chap who would never suspect the "receiving teller" of a one-night side show, treat the utility as if it operated under the name of "Jesse James, Inc."?

It is for the purpose of winning back the confidence of the people that public relations work is being advocated and practiced by many leaders in the industry, who realize that the most important phase of this work lies in schooling their own employees, who come in daily contact with the public.

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*Abstract of a paper presented before the Southwestern Public Service Association, New Orleans, April 22-25, 1924.

The active head of a large utility syndicate recently emphasized the point that, unless we in the industry tell our story effectively to the public, the other side will continue to get away with its distorted version. He emphasizes three fundamental rules, which are "know your public," "know your employee," "know your press."

### SALES EXECUTIVES AS WELL AS PRODUCTION EXECUTIVES

Recently a prominent investment banker who is heavily interested in the utility business said he was convinced that it takes just as able and high powered an executive properly to handle public relations—to "friendlyize" the public—as it does to direct operation, and that the operating executive must produce the class of service that the sales executive can successfully sell to the public.

He cited as a comparison manufacturing concerns with one vice-president directing sales and publicity, and another vice-president in charge of production, with close co-operation and team work.

This line of reasoning is creating an increasing demand for the sales executive in the utility business. The type of man who is able to make friends with the people, because he is a thorough student of human nature, has real "sales personality," and knows the knack of getting along with people even when they are disagreeable by nature.

Like the lawyer in the country court who was quoting from Blackstone. "I don't care what Blackstone says" thundered the "hick" magistrate; "I'm running this court and I know the law." "Certainly, you're absolutely right, Your Honor," said the lawyer, "I was simply trying to show you what a darn fool Blackstone was."

There is a way to penetrate every "hard shell"—even the type of fellow who won't even eat anything that agrees with him. Like the fellow I heard about recently who had never agreed with anybody in all his life, until he was shipwrecked on an African island—and he agreed with the cannibals.

A seasoned selling executive of heavy caliber doesn't make the mistake of justifying his position because he "has the best of the argument" with his customer. He knows that it is a peculiar kink of human nature that we all resent "iron clad" rules and we like to see them broken on occasions. So he permits a rule to be broken when he thinks it's good policy—or at least bends it enough to make a strong friend out of a possible enemy. It pays at times to make an exception to the most hard and fast rule. For instance, the old adage about "always starting at the bottom" is generally a good rule to follow. But it's wise to make an exception to that rule—when you're learning to swim.

People always respond better to suggestion than to demand. This perhaps applies even more to the masses than to the more intelligent classes.

Like the couple who came to a movie theater which displayed a big electric sign—"The Woman Pays." And the girl walked right up and bought the tickets without a murmur.

But I don't think it's true that "the woman always pays"—or why are so many men broke all the time? But I do know that it is true that the utility always pays a big price when its customers are entertaining misunderstandings and petty grievances.

A great many utility companies have turned to local ownership of stock as a means of closer contact with their customers. And I have recently heard more than one observing utility man advocate strong representation on the board of directors of local prominent citizens, for obvious reasons—not the least of which is to offset the popular propaganda of the peanut politician, who poisons the public mind by artful reference to the "pernicious practice" of outside ownership.

Public service securities, when properly presented, are attractive to small investors. As one fellow puts it, he can reassure himself about the safety of his money by merely sticking his head out of the window and watching a car go by, or he can press the switch and when the light comes on it is the signal that "all's well,"—or, he can console himself by turning on the gas.

### IF HE OWNS AN INTEREST, HE TAKES ONE

When the public owns an interest in a utility, it is pretty apt to take an interest in that utility. Local ownership is a shield against the unscrupulous politician, who in his "pitiful pleading" for the "dear peepul" is just about as sincere as the colored lady who was devouring a watermelon when she was interrupted with the news that her husband had been killed. "Land o' goodness," she remarked, "Jes' yuh all waits 'til ah gits thru wid dis heah watahmelyun an' yuh'll heah de mos' awfulest wailin' yuh evah heeard."

The howlings of the tricky politician wouldn't make a dent in a community where the utility company was giving good service, and a large percentage of the citizens were interested in seeing the company get a square deal.

Of course we all admire the utility that stands up and fights a lone battle, but unless backed by public good will, its protests are about as effective as the flea who was walking up the gangplank into Noah's Ark ahead of the elephant. "Hey there," shrieked the flea, "look out who you're shoving."

But when the tremendous bulk of public sentiment joins the utility's side the leaders of the opposition are not so aggressive. Looting the lonesome public utility and pilfering the property of the voters are two entirely different matters. The fat-tummied office seeker is courageous enough when he thinks his side is strongest—he'll try to get away with "murder" if he thinks nobody cares about the victim—but he never argues with real opposition when he recognizes its power.

Unless the work of sales promotion —or "friendlyizing"—is carried on vigorously, how can the public understand how to discount the distorted statements of the shrewd enemies of the utilities? Often the public is as gullible as the old lady who asked the clerk, "If this shirt is all wool, why is it labeled cotton?" The clerk replied, "Just to deceive the moths, madam."

### LOOKING BACK ON THE AKRON DISASTER

During the Akron disaster, as many of the people up our way termed the suspension of street car service in that city last February, the utility company expressed a willingness to have its books audited by any disinterested party. The opposition insisted on one party only and when the company objected, published the plausible half-truth, "Company Refuses Audit of Books."

Again, when the company said it could not operate without a loss at 5 cents with universal transfer and offered to accept a rate of fare to be established by an audit of its books, the opposition immediately shouted in print "Company Refuses to Operate Except on Own Terms."

The Akron Mayor made a campaign pledge to give Akron a straight 5-cent fare, with universal transfers—his slogan was "Nickel or Nothing." After election he notified the traction company to get off the streets or continue to operate at a loss on a straight 5-cent fare. He stated publicly that plans were all made and that the city could be "motorized" completely on short notice. The company operated something like 125 city cars and 25 city buses, with universal transfers. There were only two things for it to do and, in the language of the Pullman porter, "Bof of dem was wrong." So they chose the lesser of the evils and vacated the streets.

The Mayor promptly started to organize the promised bus system and confidently asserted that within three weeks he would have an adequate rubber-tired transportation system—and if there ever was a town where such a system was given a chance to succeed, it was Akron—"The Rubber City." The Mayor was reported as saying that he had no cost figures on bus operation, but knew that it could be done for a 5 cent fare, with free transfers. His confidence must have been somewhat shaken when responsible bus men from other cities told him that it couldn't be done profitably for less than twice 5 cents, with universal transfers.

Meanwhile transportation in Akron was part joke and part tragedy. A few good buses were operating, but many of them were wrecks that had given up the fight in other cities and were looking for a soft place to light. They drifted in from all quarters. If anybody with the wanderlust finds it inconvenient to "join the Marines and see the world," I would suggest that he "buy a bus and see America."

There is one nice thing about the present plan of forming these independent bus organizations in our section. Several bus owners get together, combine resources and form a "corporation." If one member of the organization becomes dissatisfied, he fills up his gasoline tank and drives off—with his share of the "corporation." He has no power house, track, overhead or other "immovable investments" to delay his departure.

The women of Akron finally exerted a strong influence upon the settlement of the controversy and a return to the more sane and sensible combination street-car and bus transportation system. They didn't seem to fancy the administration's independent bus transportation scheme—one female rider, after a trip on an owl bus, said the driver should have his stop signal inside the car.

When the affair was settled the Mayor claimed victory, which sounds like the fellow who had been having an argument with another chap and said he "was just going to hit him when everything got dark." "When it got light again," he said, "he felt sorry for his opponent, whose knuckles were all swollen and bleeding, where he had been hitting them with his chin."

Commenting on the return of the street cars to service in the Rubber City, a Cleveland paper pointed to the trial of bus transportation as conclusive evidence that if buses failed in "Tire Town," where the majority of citizens favored their use at the start, there was very little hope of them succeeding in any town where conditions not so favorable for a proving ground exist.

A leading bus magazine said: . . . "The service of buses and street cars must be co-ordinated with each other. One management in charge, to use each facility in its place. This is the 'Rubber City's' latest message to the transportation world."

### A PERSISTENT, ORGANIZED EFFORT NEEDED

There is no question but that the public's understanding and appreciation of the utility industry is improving. But molding public opinion is a slow job at best. It never can be accomplished with the feverish excitement that razes mountains in a few days, but rather with persistent and patient everyday effort, regular and methodical. This is what constitutes the faculty and genius for organization.

Think of the combined power and influence of the manufacturers who make materials used by the utilities and are, therefore, dependent upon this industry for their existence. There are armies of factory workers who should be shown that it is to their own selfish interest to boost for the industry. There are thousands of salesmen who, in their travels, have excellent opportunities to accomplish good. There are all the stockholders—many of them influential citizens—who can add their weight to the movement. There are concerns from whom we buy our raw materials, who have seldom realized that they have a dollars and cents interest in the welfare of the industry.

Recognizing that this great source of influence was lying practically unused, the American Electric Railway Association decided a little more than two years ago to make use of it.

A special committee on co-operation of manufacturers was organized and has been able to accomplish quite a good deal, despite the handicap of having the writer as its chairman. No doubt the committee at first felt like expressing to its chairman the sentiment of Jonah when he said to the whale, "If you'd kept your mouth shut, this never would have happened."

At first our committee found it difficult to get some manufacturers to warm up to the plan. But we were not discouraged; we remembered that tombstones at long range seem cold and cheerless, but when you get close to them you usually find that they have something good to say for the people they are holding down.

We felt that our cause was a worthy one and that the manufacturers would support it, when the plan was made clear to them. We realized that the electric railway industry had been subjected to a long, hard struggle, but felt confident that its efforts to live and prosper would be rewarded and that it certainly was entitled to receive active co-operation from the manufacturers.

Of course we struck pessimists. One manufacturer told me dolefully he didn't think the electric railways could survive much longer. I said to him, cheer up, here's a point which I believe even you can understand.

An Arkansas farmer had struggled for a long time with a sick horse. His neighbor, who had lost a horse rather suddenly, said to him, "What's the use of going to all that trouble, you'll never save that horse." To which the farmer replied, "It stands to reason that the horse that has a long, lingering illness is more apt to live than the one that gets took with a sudden sickness that kills it quick."

To-day our committee has the active co-operation of something like 250 manufacturers in the work.

By combining the strength of operators and manufacturers, and all others connected with the industry, into a powerful unit, thoroughly organized and skillfully directed, it would be quite possible to place the political demagogue and his partner, the prevaricating press, in just about the predicament of the colored soldier who was asked what he would do if he was guarding a hundred feet of trench all alone and saw a hundred of the enemy swiftly advancing toward him. He scratched his head a moment and then answered, "Boss, ah think ah'd go back an' spread de news."

The news would soon be spread that the utility industry was poor picking for pilferers if every one of us whose welfare is linked with the welfare of the industry would only make his identity unmistakably known.

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# Steels for Special Trackwork*

BY JAMES H. BUDD
Traveling Engineer Bethlehem Steel Company

THE buyer of special trackwork has the problem of choosing between plain cast-carbon steel, manganese steel and the various special alloy steels. Each has its own individual properties.

The introduction and development of the welder as a repair tool has reached such proportions that it has become an important factor in trackwork maintenance. Cast carbon steel can be most easily repaired by welding, but has the shortest first life. Cast manganese is the most difficult to repair by welding, but undoubtedly has the longest first life. The cast alloy grade is between the other two, but is still in the experimental stage.

In choosing between these grades of steel one should be governed not only by the ease or difficulty of repairing by welding, but also by the first cost and the cost of installation and reinstallation. I question if the "weldability" should be the governing factor.

From the manufacturing standpoint, manganese steel is a tried and proved product. It is made in quantities, and therefore produced with economy. It has the valuable characteristic that it can be cold straightened satisfactorily. This shop operation is a good test of the quality of the casting, as a piece of improper analysis or faulty heat treatment will not pass this bending test.

It satisfactorily resists the wear and pounding of the car wheel in paved track, with the accompanying grinding, gritty conditions. It is easily fabricated, and is a tough and rugged product when finished. It is used not only for trackwork but also for commercial castings, which helps to keep the foundry producing units in continuous and economical operation.

Considerable progress has been made of late in the art of welding manganese steel. It would seem quite within the realm of possibility that sooner or later a satisfactory and economical method will be found. Some good welds are being made today, but nobody seems to be able to tell why a certain weld is good and the next one bad. It must be largely a lack of knowledge of proper technique on the part of the welder, as manganese steel has shown a remarkable uniformity of quality extending over a long period of years.

And right here I would like to suggest that handsome returns would be yielded by the proper solution of this welding problem. The American Electric Railway Association or any body of street railway properties could well afford to set aside a good sum of money for research work in this direction. It also is a subject that should very properly be handled and directed by the street railway engineer rather than by the manufacturer of managanese steel. Many millions of dollars are invested in manganese steel trackwork, the life of which could be prolonged by welding. It would be money well spent if a proper welding method could be found.

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*Abstract of a paper presented before the Southwestern Public Service Association, New Orleans, April 22-25, 1924.

Ordinary cast carbon steel is easy to weld, and while not having as long a first life as managanese, it can be welded to give a fairly long service life. For years good serviceable trackwork was made from steel of this grade, before the advent of manganese. It is also a standard grade of steel produced for a large variety of purposes and therefore on tap, so to speak, for track castings. It requires a reasonably careful annealing treatment, but no other.

Some interesting pioneer experimental work has been done with chrome-nickel alloy steel, as it seems to offer the greatest possibilities among alloy steels. The results of actual service tests are awaited with interest. However, it is a relatively new and untried steel for track castings and is now in an experimental stage both from the standpoint of the railway and that of the manufacturer. It is more expensive to make and fabricate than either manganese or carbon steel. It is an entirely special grade, not being used in commercial foundries for any other products. Consequently every heat of this steel produced is special, which makes it expensive. Once made, it must be treated with far more care than either manganese or carbon steel, requiring a double heat treatment. Once treated, it is a springy, tough, resilient steel that resists cold straightening to bring it to proper line and surface. If it is heated locally for fabricating reasons, the previous carefull treatment is jeopardized. This sensitiveness to heat and the presence of alloys further increases the difficulties of welding.

The manufacture of rolled chrome-nickel steel does not present such difficulties, as this steel is cast in standard ingots which are later rolled into blooms and are cropped sufficiently to remove all defects; the resulting product is a sound homogeneous steel. It is, of course, always preferable to use rolled products in all cases where practicable.

For this reason, the Bethlehem Steel Company has developed a type of crossing that has worked out quite satisfactorily for crossing angles of 45 to 90 deg. The design has not yet been perfected for smaller angles and frogs. To produce this crossing, a special girder guard rail is rolled of chrome nickel steel with a full head. These rails are assembled in the shape of a crossing and are then ironbound together in one solid piece. This is the standard form of iron binding and cast welding. Flangeways of the proper depth and width are then machined in this full head rail. As a last operation, the bottoms of the flangeways are hardened.

In regard to the relative merits of the three grades of steel under discussion, it would seem that manganese steel, all things considered, is best adapted to meet the exacting requirements of electric railway special trackwork. Cast alloy steel is still in the experimental stage and results of service tests should be awaited before plunging deeper with this product. Cast carbon steel or rolled alloy steel can be used where "weldability" is of greater importance than long first life.

# The Bus and the Railway and the Outlook*

By W. B. Tuttle

President San Antonio Public Service Company

In the present stage of bus development the best statistics obtainable indicate that where there is a very heavy volume of traffic to be handled cars operated on tracks are more effective in transportation and are more economical than motor buses, in spite of the fact that heavy street construction charges and street maintenance expense and taxes on track installation are assessed against the cost of transportation on rails, while it is not customary for motor buses to bear an equivalent roadway expense.

There are, however, several fields where it seems that motor bus transportation may be desirable. Some of these are as follows:

1.—Shuttle lines on extensions into developing communities, where there is as yet not sufficient population to warrant a heavy capital expenditure in tracks.

2.—To give transportation where there is some legal or physical reason why it is not feasible to construct a car line.

3.—To give more direct routings in sections where the development of the city changed traffic conditions, and where existing car lines cannot be rerouted because of prohibitive cost, or because of franchise or legal restrictions.

4.—To provide additional transportation, particularly in peak hours where track or street capacity is already filled and where there is the necessity of additional transportation facilities.

5—To provide a supplemental and preferred service which will attract patrons who are not now availing themselves of street railway transportation.

Taking up the first field of operation, we are immediately confronted with the condition that in all probability if there is not enough business in a new territory to support a street car line with one-man car operation, there is probably not enough business to support a bus line. This would seem immediately to preclude bus operation, but such is not necessarily the fact.

Regular public transportation is a necessity, and it is the duty of the public transportation company to provide it under reasonable conditions. This being true, the public and the authorities must recognize the fact that, for the good of the whole community, unprofitable operations in certain localities must be carried on, and that these operations must necessarily be supported by profitable operations in other localities. This principle has been tacitly recognized for many years in street railway operations. The last half mile of almost any car line is unprofitable. Under such conditions, it may be proper to put on bus transportation in thinly settled sections of any community, even though this service is not self-supporting.

One of the problems in feeder bus line operations is that of good roads. In the early days, when street railway construction and operation costs were only a fraction of what they are now, the street railways pioneered into undeveloped portions of the cities they served, and good roads followed them at a much later date. This is not possible with buses, as one of the essentials for successful operation is a first-class paved roadway.

In the second field of operation, there may be conditions where restrictions imposed by some governing body, or by provisions in the deed of conveyance of some public park or place, prevents the issuing of permits for track construction, or where such hazards and burdens are placed on the investment that track construction cannot be undertaken; or there may be physical reasons, such as the character of bridges, which would prevent the construction of a car line. It may be that public transportation can only be given by bus line operation.

The third field for bus transportation is apt to arise in any growing city, and it is brought about largely by the failure on the part of almost every city to adopt a comprehensive city plan of development.

As cities expanded, the earlier street car lines were built where traffic existed or could be expected, and as the development of property was controlled mainly by the land owner and real estate man, little attention was paid to the effect of the routes of traffic then established on the future growth of the city. The result in many cases was indirect and tortuous street railway routes. Under such conditions, a large portion of the public may greatly desire more direct and quicker transportation, and yet it is possible that the street railway lines cannot be changed on account of the development of business establishments along the existing routes, or on account of the pressure of public opinion, or the effect of franchise and legal restrictions. Bus service may be the only solution of the transportation problems under such conditions.

The fourth field for bus operation is possible; particularly in some of our older cities, where the streets in the central business district are narrow. As a usual thing, a large portion of the traveling public desires to go into or near this district, and the operation of street cars through the center of such a district is a convenience and a necessity for the majority of the people, and yet, with the tremendous increase in the use of motor vehicles, street congestion may become so acute that it is impossible to operate a sufficient number of street cars through the district during the rush hours to accommodate all those who wish to travel.

Under such a condition, the establishment of bus routes, which avoid the most congested sections, may be necessary as an auxiliary and substitute for additional street railway service. Such bus routes will be patronized by those who do not have to go into the most congested section, and by those who prefer a short walk from the bus line rather than the delays of traffic. Such a condition may warrant the establishment of bus lines, either throughout the entire day or during the rush hours.

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*Abstract of paper presented before Southwestern Public Service Association Convention at New Orleans, April 22-25.

The fifth field for bus operation is due to psychological rather than economic causes. The experience of the bus lines in a number of cities would seem to indicate that there is a considerable portion of the public who prefer to ride on buses rather than on street cars, even at a higher rate of fare. This mental attitude has probably come about largely on account of the tremendous development of the automobile riding habit in the last ten years. In many cases people will try to crowd into an automobile at considerable physical discomfort rather than to ride on a street car where there is plenty of room. This attitude toward public transportation may be a temporary thing, akin to the craze for roller skating or automobiling which have swept the country in the past, but it certainly exists today, and must be given consideration.

Where the installation of motor bus service is contemplated, careful consideration must be given to the operating cost and the rate of fare that will be charged. Comparisons are sometimes drawn with motor bus fare in Europe, particularly in the city of London, which are misleading. Motor bus service in London is probably more highly developed than anywhere else in the world, the buses there carrying approximately three and one-half million passengers each day. The rate of fare is dependent on the length of haul. On account of the mixing of business centers with residential districts in London, there is a very large portion of short-haul riding, and one bus may fill and empty several times on a given trip. The short-haul fare is correspondingly low.

Conditions in the United States are very different, as in most cities a large part of the traffic is through service from the business center to residential suburbs, with a flat fare for the entire distance or any part of it. Under these conditions, the short-haul rides cost more in some cases than they do in London, but the long hauls are often made for a much less fare.

Public transportation is a necessity, and the experience in many cities has shown that public transportation can be properly supplied only when all of it is handled by one responsible company which will co-ordinate and regulate all the service. There are portions of every community which need public transportation service, and yet where this service cannot at the time be profitably conducted. It therefore cannot be conducted at all, unless the whole service is carried by one agency and the profitable sections are made to support the unprofitable sections. The public and the community in general will surely suffer if reasonable transportation facilities are not provided, and therefore public interest demands the operation of all local street transportation facilities by one strong agency. Moreover, every public transportation company must have the maximum possible volume of business if the costs of transportation to the public are to be kept at a minimum. The operation of bus service, which will attract a class of passengers which would not otherwise be obtained, may be desirable to meet this condition.

Bus operation in the United States is still in the experimental stage, but there is a feeling on the part of the public that it is a desirable and a coming form of public transportation. There are many cases where it may be a valuable auxiliary to street railway service. There are some cases where it may be necessary to replace street railway service with it.

# American Association News

## Engineering Manual in New Form

THE new edition of the Manual of the Engineering Association, soon to be ready for distribution, contains many new features. Perhaps the one which will appeal most is the change from a loose-leaf publication 3½ in. thick to a 1,000-page book less than 1½ in. thick. The new Manual will be bound in cloth, uniform with the annual proceedings. Other important changes are a new system of grouping the sections dealing with each general subject and of numbering individual sections; elimination of nearly all folded sheets; substitution for the historical data in each individual section of a brief statement indicating the years of adoption and revisions.

The change to the bound form was decided on after a careful study of the requirements. A principal complant against the loose-leaf Manual was the difficulty of inserting new and revised sections and in removing superseded sections.

A new edition of the Manual will be published every third year. In the intervening years supplements will be issued containing all revisions and additions. The various committees have reviewed carefully all sections so that they represent the best and most modern practice. This review was completed in 1923, and the new Manual contains all the changes approved at the 1923 convention.

The Manual is divided into eight main parts, as shown in an accompanying table. In the new system of designating the sections, the letter corresponding to the proper one of the eight divisions is followed by the serial number. Standards in each class are numbered from 1 to 99; recommendations from 100 to 199; miscellaneous methods and practices from 200 to 299. In each of the general groups the sections are numbered in order of their adoption. Following the section letter and number is another number indicating the year of adoption or latest revision. As an illustration, the standard design of axles is specification E3—23. The "E" indicates the equipment section; the figure "3" that this was the third standard adopted in its class, the "23" after the dash that it was adopted or last revised in 1923.

Each general section of the new Manual is a complete unit with table of contents and title page. The Manual committee has been authorized to have printed and bound in paper a supply of these sections. The practice of maintaining a supply of individual Manual sections will be discontinued.

The following prices have been authorized for the new Manual, cloth bound, and for the general sections, paper bound:

ENGINEERING MANUAL—CLOTH BOUND

| | |
|---|---|
| To member companies | $5.00 |
| To individual members | 5.00 |
| To non-members | 7.50 |
| Rebate allowed for the return of an old Manual with binder, for each new Manual purchased | 1.50 |

GENERAL SECTIONS—PAPER BOUND

| Section | | Member Companies and Individual Members | Non-Members |
|---|---|---|---|
| B | Buildings and structures | $0.75 each | $1.00 each |
| D | Power transmission and distribution | 1.00 | 1.25 |
| E | Equipment | .75 | 1.00 |
| G | Power generation and conversion | .50 | .75 |
| PS | Purchases and stores | .50 | .75 |
| S | Signaling | .50 | .75 |
| W | Way matters | 1.00 | 1.25 |
| WP | Wood preservation | .75 | 1.00 |

It is especially desirable that the old edition be removed from circulation in order to avoid confusion and error. To accelerate its withdrawal a rebate will be allowed for the return of copies with the binders when purchasing an equal number of the new edition.

Compilation of the new edition has been carried on under the direction of G. C. Hecker, special engineer, under the supervision of the Engineering Manual committee consisting of R. C. Cram, chairman; C. R. Harte and Daniel Durie. The committee members have devoted a great deal of time to the revision and have contributed many new drawings to eliminate the folded pages.

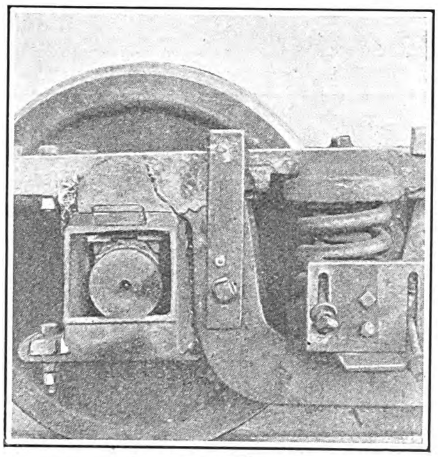
## Association Appoints Delegates to Chamber of Commerce Meeting

THE American Electric Railway Association has appointed the usual number of ten delegates and equal number of alternates to attend the annual meeting of the Chamber of Commerce of the United States to be held in Cleveland May 6-8. The names of the representatives follow, the first in each group being the national councillor: Delegates: J. N. Shannahan, F. R. Coates, C. E. Morgan, W. H. Sawyer, R. P. Stevens, L. S. Storrs, E. F. Wickwire, J. J. Stanley, Harry Reid, James P. Barnes. Alternates: J. H. Hanna, H. W. Blake, Thomas Fitzgerald, Cornell S. Hawley, H. J. Kenfield, T. O. Kennedy, Paul E. Wilson, Norman McD. Crawford, Dudley Farrand, L. H. Palmer.

# Maintenance of Equipment

## Safety Strap for Equalizer

SOME trouble has been experienced from equalizer bars breaking at the bends adjacent to the journal boxes by the Philadelphia & Western Railway, Norristown, Pa. In order to insure that an accident would not result from breakage of these bars while in service, a safety strap has been added as shown in the accompanying illustration. This strap fits over the top of the truck frame and extends down on the sides of the two equalizer bars. The straps, which are 3 in. by 2 in., are bolted through the equalizer bars so as to hold them in position. This also acts to take some weight off the equalizer bars. A spacer of 1-in. pipe is used between the two equalizer bars, the bolt passing through this. With his construction bars have been found cracked, but still in proper position.



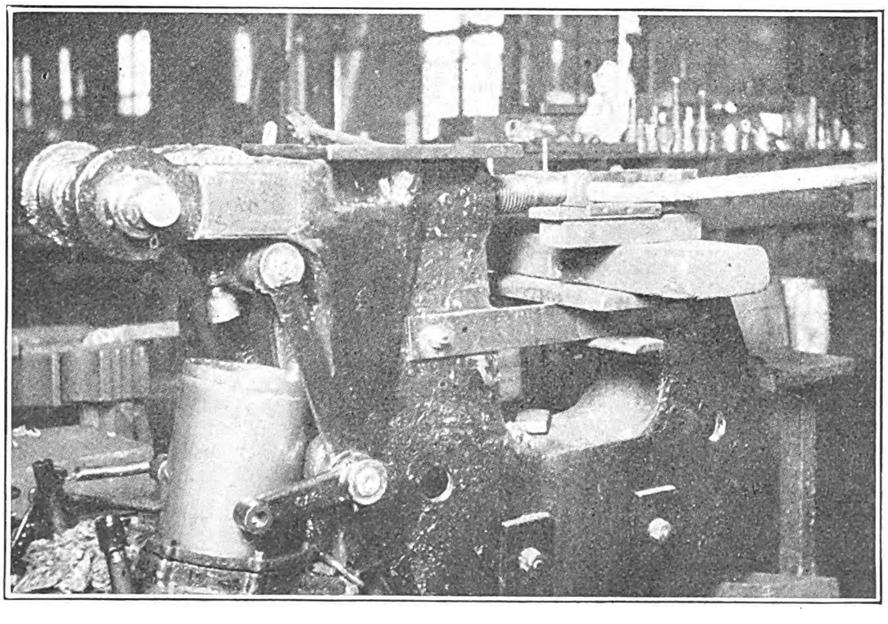
Accident from Cracked Equalizer Bar Prevented by Safety Strap

## Riveting Machine Straightens Trolley Poles

AN UNUSUAL, yet practical, use is made of an air-operated "Hanna" horizontal riveting machine in the shop of the Pittsburgh Railways for straightening trolley poles. The pole is held in position by a simple fixture, while pressure is applied to the bend through dies attached to the jaws of the riveter.

The fixture is made up of a 6-in. x 2-in. wood member, approximately 2 ft. long, with cleats nailed to one side near each end. These serve to hold the bent pole in position during straightening. The dies on the jaws of the machine are shaped to fit the trolley pole. A single bearing is provided on one jaw while the attachment on the other jaw has two points of contact approximately 18 in. apart.

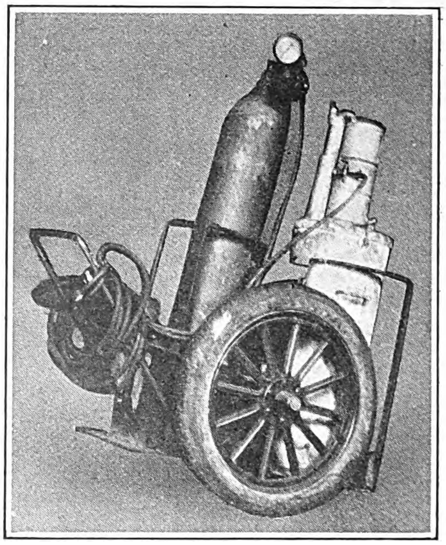
The pole is placed on the fixture with the bend at the single contact die and pressure is applied until the bend is removed and the pole brought into line.



Horizontal Riveting Machine, Equipped with Fixture for Straightening Trolley Poles

## Welding Outfit on Pneumatic Tires

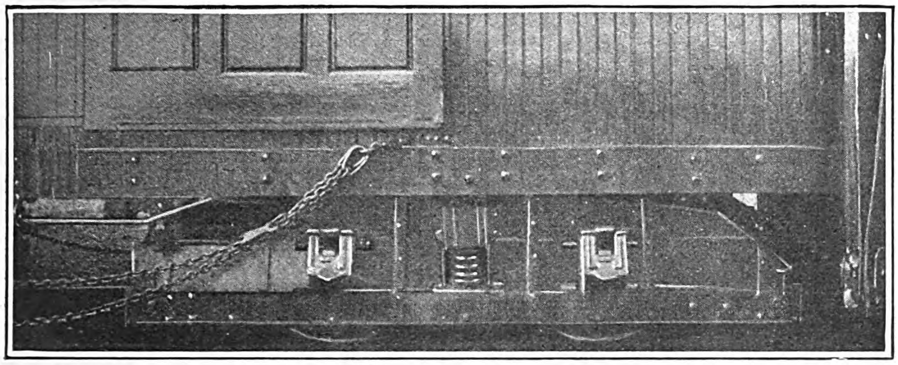
A RUBBER-TIRED carriage is used in the shops of the Indiana Service Corporation, Fort Wayne, to transport a portable welding outfit from place to place. The outfit includes an acetylene generator as well as tank and hose. The practice of carrying an acetylene generator for supplying gas requires a smoother riding carriage than is necessary with rechargeable acetylene tanks.



Pneumatically Tired Carriage Is Used in the Fort Wayne Shops of the Indiana Service Corporation for Transporting Welding Outfit

Two Ford wheels with tires are mounted on an axle 24 in. long with ends tapered and threaded to take the customary Ford automobile ball bearings. An underslung platform is hung from and extends on each side of the axle. This is made of one piece of $\frac{3}{8}$-in. steel carried over the axle. Uprights of steel 1 in. x $\frac{1}{4}$ in. are provided on each platform to hold the tanks, which are fastened in position by hooks between the uprights. A round iron handle fastened to one platform and braced to the axle serves as a means for propelling the carriage about the shop.

As this outfit is used in the carhouse as well as the repair shops, the rubber tires facilitate the movement over tracks and rough floors.



Blocked-In Truck on Snow Plow of Union Street Railway

## Blocked-In Trucks Save Motor Maintenance

IT IS common practice in New England where the street railways encounter severe winter snow conditions to block in with wood the truck frames of snow plows and sweepers. The accompanying illustration shows a plow of the Union Street Railway, New Bedford, the trucks of which have been thus blocked in. The protection afforded has been useful in reducing damage to motors, but of course it makes more difficult the work of inspection and repairs when these are necessary.

## Testing Automatic Couplers

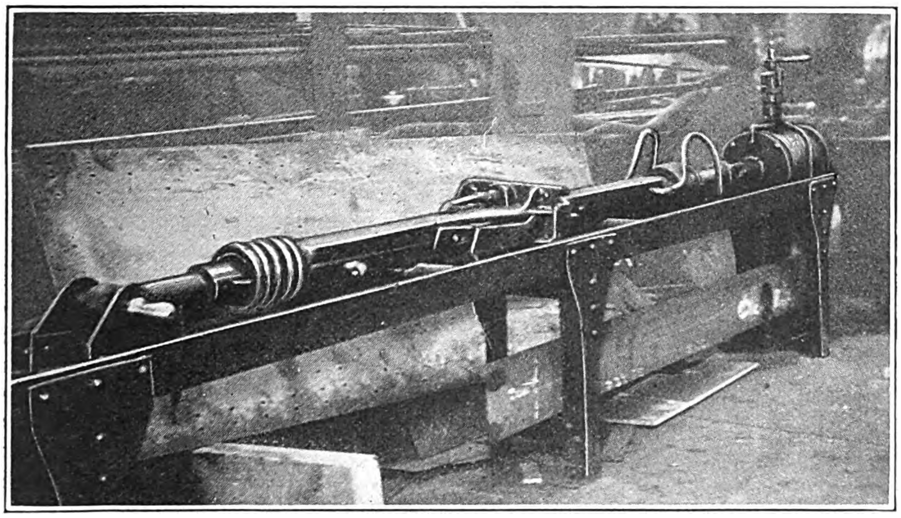
AN APPARATUS has been worked out in the shops of the Cleveland Railway for testing new and repaired Tomlinson automatic air and car couplers. The test consists of making a coupling between the coupler under test and a master coupler, subjecting the two to a pull of 12,300 lb. and endeavoring to "break" the coupling by pulling the release levers. It is aimed to duplicate service conditions as far as possible.

The device is constructed of heavy angle irons of sufficient length to accommodate the two couplers and a brake cylinder. The cylinder is mounted at one end of the frame work and has the necessary piping and engineer's valve for admitting air to either side of the piston. The master coupler is permanently fastened to the piston rod and is further supported by a cross member of the frame, near the head. At the other end of the apparatus the coupler to be tested is fastened to two lugs by means of a removable pin. A cross member supports the coupler near the head.

With the couplers lined up, air is admitted to the head side of the brake cylinder, forcing the drawbars together and effecting a coupling. The air is then released and admitted to the other side of the piston, producing a pull between the couplers. If they disengage under this pull, which is approximately 12,300 lb., or if it is possible to uncouple by pulling the release lever while the couplers are under load, the coupler is not fit for service and is further repaired.

While the couplers are engaged, air is admitted to the coupler air line as a test on the air line gaskets on the face of the coupler.

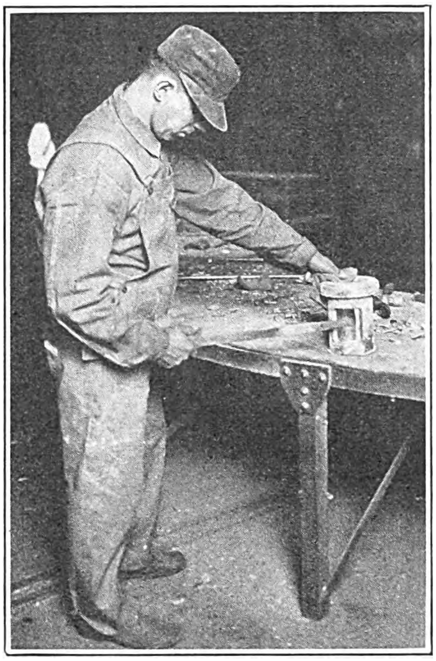
This apparatus has helped to eliminate failures of couplers while in service. As many as 80 couplers are tested during a month.



Apparatus in Cleveland Shops Tests Couplers Under Service Conditions

## Removing Excess Babbitt with Hot Iron

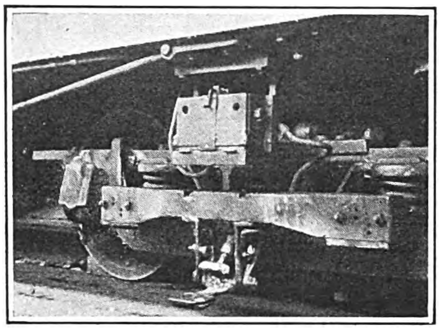
WHEN bearings are babbitted the molds frequently allow burrs and an excess of babbitt at certain points, particularly around the window of the bearing. If this is chipped off with a chisel there is danger of loosening the babbitt. A method of removing excess babbitt from bearing shells by melting it off with a hot iron is practiced in the shops of the Brooklyn-Manhattan Transit System. This method saves considerable time over that required for chipping or scraping off the excess metal and there is no danger of loosening the lining from the shell.



Opening Up a Window with a Hot Iron in Babbitting Department of Brooklyn-Manhattan Transit System

## Shoe Fuse Box Mounted on Car Body

A WOODEN shoe fuse box with transite lining is used by the Philadelphia & Western Railway, Norristown, Pa. In the original installation this box was mounted on top of the shoe beam. Vibration from the trucks caused considerable trouble. The angle straps used to support the box would break, the boxes themselves would shake apart, terminals would work loose, fuses would break and burning at connections would result. In order to remedy this trouble the company is now mounting its shoe fuse boxes directly on the car body. They are supported by two ¼-in. x 3-in. strap hangers, so as to bring them down to a convenient location for attaching the flexible leads running to the shoe beams. An accompanying illustration shows a shoe fuse box with the latest mounting. Care is taken to locate the box so that the swinging of the truck on curves will not interfere with the box and leads are brought out of sufficient length to take care of any turning. This method of mounting has effectively solved the difficulties previously experienced.



**Shoe Fuse Box Supported from the Car Body by Straps**

## New Equipment Available

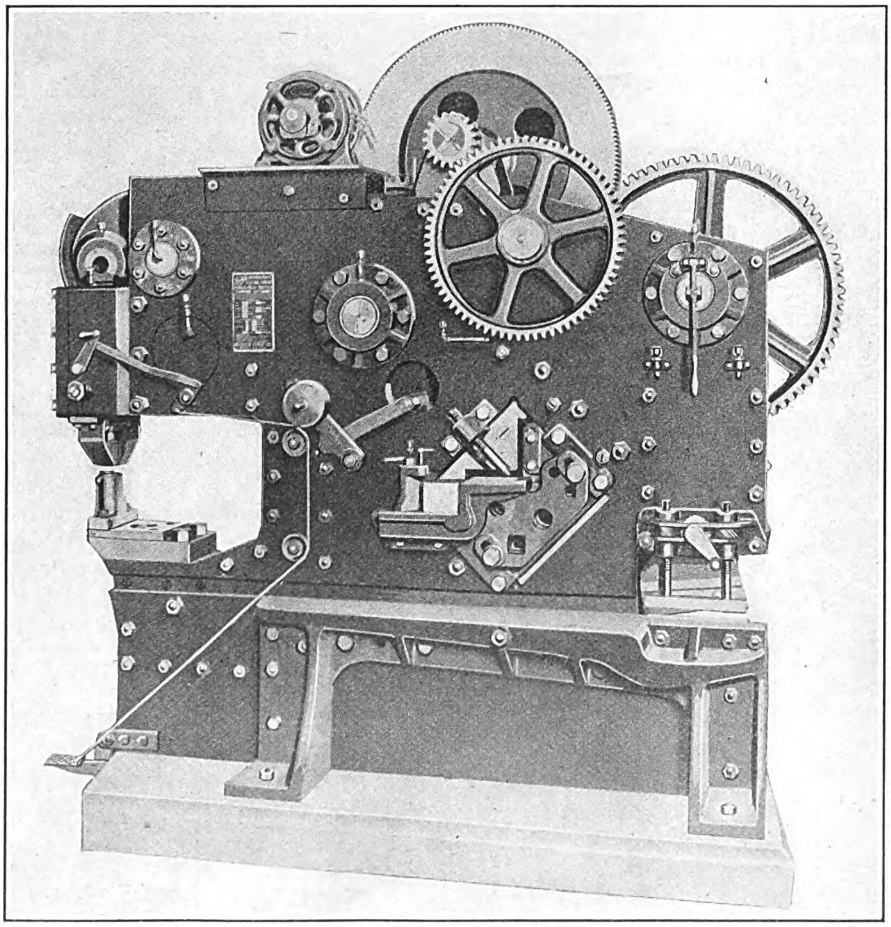
### New Slitting Shear, Punch and Bar Cutter

A SERIES of new combined slitting shear, punch and bar cutters with diagonal bar cutter plunger has been brought out by the Buffalo Forge Company, Buffalo, N. Y. The two smaller sizes of the series have but one plunger for both the bar cutter and slitting shear. In the larger machines there is a separate plunger for each of these operations.

Among the changes made is an improved mitering arrangement, new type main gears, a heavier side bracket and a shift in position of the gear type shear clutch. With the old style mitering attachment it was necessary to move the stripper screw for each different angle of square cutting. With the new design the stripper screw is universal and requires no adjustment. Due to the diagonal bar cutter arrangement of the new machines, angles can be mitered or beveled on a horizontal plane. The new type gears are of steel and are smaller. The side bracket used for supporting the plates when a slitting operation is under way has the bracket and the two supporting legs cast in one piece. These machines are made with an extra high throat for handling material and the holes can be punched without turning the section over.

When it is desired to punch in the flange of channels or H columns it is only necessary to remove two bolts at the base of the die block, lift off the high die holder and replace the short punch holder with the long one. The punch is then ready for any standard beam, channel, girder or "H" section. Either block and punch is suitable for punching flats. The punch is provided with a gag, making it semi-floating. The bar cutter is engaged by shifting the ram by means of a counterweight lever. Stops for shearing angles, squares or 45-deg. miter are fixed, making it unnecessary to mark the angles.

The punching capacity of the new series ranges from 1 in. x ½ in. for the smallest machine to 1¾ x 1½ in. for the largest; slitting plates capacity ranges from ½ in. to 1½ in. Other capacities, such as that for squares, rounds, angles, etc., have a corresponding range.



**Improved Punch, Shear and Cutter for Bars and Sheet Metal**

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### Shop Compressor Governor

A NEW pressure governor, for use in maintaining pressure in shop air and water systems, has been designed by the General Electric Company, Schenectady, N. Y. In operation, the governor element is set for a maximum and minimum range of pressure. An auxiliary relay is energized to open the control circuit of the panel when maximum pressure is reached and to close it at the minimum pressure. The electrical connections are arranged so that the governor contacts do not carry current or break contact.

The electrical mechanism is of strong construction. Contact tips are silver plated to give low resistance contact and to eliminate burning and sticking. The device is inclosed in a cast-iron box with a glass window through which the indicating dial is visible. The complete unit is designed for wall mounting. It is about 10 in. square and 4 in. deep.

# The News of the Industry

## Five Arbitrators Will Decide Cleveland Wages

An arbitration board of five members instead of three, will act in the dispute between the Cleveland Railway, Cleveland, Ohio, and its platform employees in the demand of the local union for increased wages and new working conditions. The present agreement between the men and the company calls for arbitration by a board of three members, but because the board of that size a year ago failed to give the men all they thought they were entitled to the union asked that the board this year consist of five members. This request has been granted by John J. Stanley, president of the company, who stated that he had no objection to an additional arbiter being named by each side.

The company has named as its arbitrators Attorney Charles Higley and Thomas P. Schmidt, a company director, while the union has selected United States District Attorney A. E. Bernsteen and Max Hayes, editor of the *Citizen*, a Cleveland labor publication. These four arbitrators have five days in which to pick the fifth member. If they fail, the company itself and the union will seek to agree upon a fifth member of the board, and if they also fail, after five days, the appointment of the fifth member will be made by the local Federal judge.

The Cleveland conductors and motormen will demand 85 cents an hour for the first three months' service, 87 cents an hour for the next nine months and 90 cents an hour after the first year. Their present wage scale is 55, 57, and 60 cents. They are also asking many changes in their working conditions, including an eight-hour day and two weeks vacation with pay.

## Strike Averted in Pittsburgh

Eleventh hour efforts by Mayor Magee to avert a car strike in Pittsburgh, Pa., were successful on May 1 following an announcement by John L. Nelson, business agent of the carmen, to the effect that the threatened walkout would be deferred in order to meet with representatives of the Pittsburgh Railways for further parleys. At two different meetings on April 30 A. W. Thompson, president of the Philadelphia Company, parent company of the railways company, insisted that no increase could be granted. The men are now receiving 67 cents an hour, maximum pay, and are asking 75 and 77 cents for the first and second years of the contract. The contract expired on May 1.

In a full-page spread in the Pittsburgh *Post* of April 30 the company, in response to many questions asked relative to the contract of the city of Pittsburgh, the Pittsburgh Railways and the Philadelphia Company, reprints the agreement drawn up on Dec. 20, 1921. One article of this agreement includes the formation of a traction conference board under the new agreement with the city to sit in judgment on quesitons affecting railway operation. This board has never functioned and might now provide a means of immediate settlement. For the information of the car riders and others interested the company has told its story in voluminous "ads" in recent newspaper editions.

## Perjury Admitted by Witness in Buffalo Dynamiting Case

State Senator Robert C. Lacey, Buffalo, former president of the Central Labor Council, has entered a plea of guilty before Federal Judge John R. Hazel in the United States Court for the Western District of New York, to a charge of perjury in connection with the dynamiting of a Buffalo-Niagara Falls high-speed interurban train in August, 1922. He was fined $500 and sentenced to the Erie County Jail for one day. Through his conviction, Lacey loses his citizenship and automatically is expelled from the New York State Senate.

Lacey was one of twelve men indicted by the Federal Grand Jury on various charges growing out of the dynamiting of the interurban train during the strike. The light sentence imposed upon him was due to the plea made by United States District Attorney William J. Donovan, who informed the court that Lacey has made a full and complete confession of the part he played in the alleged conspiracy and that he had been a big help to the government in obtaining evidence against other labor leaders and striking employees of the railway.

It was announced that the trial of other defendants, including John M. Parker, president of the Buffalo local of the Amalgamated; Clarence F. Conroy, business agent of the Buffalo local, and Vincent Tuero, financial secretary, will be moved at once. It is expected Lacey will be used by the government as a witness against them. The court was informed that it was through the confession of Lacey that Alvin Heineman of Lockport was produced as a witness to testify regarding the theft of the dynamite from a powder magazine in that city. Some of the dynamite was carried in Lacey's automobile.

The perjury charge against Lacey grew out of his first appearance before the Grand Jury at the investigation into the dynamiting outrage. In his explanation of the evidence against Lacey, Colonel Donovan, the government prosecutor, said to the court:

> Lacey falsely swore in answer to a question that he was not at the home of several strikers already indicted in this case; that he did not know them; that he did not know there were certain bundles in the house, and that he did not aid or assist in transporting the bundles. ✓

## Jitneys Defeated in Youngstown

At the election held on April 29 in Youngstown, Ohio, the so-called "jitney referendum ordinance" initiated by the jitney operators was defeated by more than 870 votes out of a total of 15,000 votes cast. The jitneys had practically been eliminated as competitors of the Pennsylvania-Ohio Electric Company by recent action of the City Council prohibiting them from entering or loading in the business district around the Public Square. The referendum ordinance was initiated by the jitney men to enable them to enter the forbidden district where they could divert some of the business from the railway.

The principal questions involved, as brought out in the pre-election arguments for and against the ordinance, were whether or not the city authorities should continue to control the traffic on the streets and also whether or not the jitneys should be allowed to take away a portion of the revenues of the railway, which would ultimately result in an increase in fares by the terms of the service-at-cost franchise under which the railway operates.

## Transit Legislation for New York City Signed

Governor Smith of New York, on the morning of May 2, signed the act passed by the last Legislature creating a new Board of Transportation of three members for New York City under which the Mayor will have authority to undertake the planning and construction of new rapid transit railroads.

## Springfield Jitney Men Refused Extension

As a result of the Transportation Board of Springfield, Mass., refusing to grant an extension of time to jitney operators all licenses for jitney operation expired on May 1. The men had sought an extension to allow officials to check up on the 25,000 signatures on petitions which had been filed for the continuance of bus service. The Transportation Board decided that the referendum was not a fair expression and would not consider the results. The Mayor had determined that bus operation would cease on May 1, thereby giving the transportation monopoly to the Springfield Street Railway. However, he told the bus men's counsel that their request for reconsideration of this decision would be granted provided the request be backed by one-half of the voters. An aggressive campaign was then started by the jitney men to obtain signatures of one-half of the registered voters.

# State Aid Sought

### Virginia Railway & Power Company Seeks Settlement of Franchise Controversy in Richmond

Richmond's franchise fight has suddenly taken on life again after five years of pendulamic animation. Shortly after Easter the Virginia Railway & Power Company, following its policy publicly announced in its annual report, petitioned the State Corporation Commission for a valuation of its Richmond railway property.

News of the filing of the petition, coming as it did on the heels of the announcement of Ordway Puller, chairman of the committee on streets of the Council, that some action would be taken within sixty days on the company's petition for a blanket franchise, brought a diversity of public opinion.

Councilmen immediately petitioned for a meeting of that body, at which time the city will answer this step of the company.

### Company's Case Recited

After reciting the situation, sketching its history briefly, the company petitions the commission to investigate and find:

> What is the reasonable and fair present value for rate-making purposes of the property of your petitioner used in the railway division in the city of Richmond; that is to say, the electric railway system of the city of Richmond, and as a part of said system those lines which are extensions of city lines into the counties of Chesterfield and Henrico, and on such basis fix such rates, tolls and charges for the service to be rendered as shall be just and reasonable.

It will be remembered that the Corporation Commission recently relieved the company of the necessity of paving the center of High Street in Portsmouth, as required in its franchises, and fixed a 7-cent fare in Norfolk on the basis of the city's own valuation figures of the company's property.

The Virginia Railway & Power Company is operating in Richmond on a 6-cent fare granted under an ordinance adopted by Council relieving it of the necessity of continuing operation on a 5-cent fare basis and other similar obligations, including cheap labor tickets during rush hours.

### Company's Appeal Ignored

The company's petition for a blanket franchise was renewed several years ago. The first petition of the kind was presented to Council about 12 years ago. It has been sleeping peacefully in committee ever since.

Councilmen expressed amazement at the company's stand following the filing of the petition. Chairman Puller authorized the following statement:

> After agreeing in previous franchises to city control of rates, the company is now apparently unwilling to abide by its contract and wants to take away this control, as well as control of extensions and improvements and pavement obligations, and go on using the streets and enjoying the privileges of the city as before. I cannot understand why the company wants us to prepare a new franchise and at the moment we are ready to discuss it begin to undermine the very principles upon which the franchise will be based.
>
> I believe the committee will stand by the report of the John A. Beeler organization, which valued the power company's properties at $7,374,975, as compared with the $13,619,719 valuation set by Stone & Webster, the power company's experts.
>
> It is absurd for the Virginia Railway & Power Company to expect the Corporation Commission to make a valuation of its own unless it rules definitely that the state has the power to fix the rates, and the city valuation is as good a one as the power company's unless the commission does make such a ruling. If the commission makes such a rule after the power company gets a new franchise the franchise will not be worth anything.

The company explained its action in a full-page advertisement in which the greater part of the company's petition was reproduced and the history of the franchise from the date it was filed in 1920 to the present time was reproduced. The Beeler report was reviewed and it was pointed out that the city for months has taken no action on this paper.

Supplementing this advertisement, E. Randolph Williams, vice-president and general counsel, issued the following statement:

> It would be best for the city as well as the company if the State Corporation Commission assumes the authority to fix fare rates within the corporate limits of Richmond because it will take this all important question out of politics. In every city in the country where traction companies have been able to operate successfully the rate-making power has been given to the state.

The Corporation Commission has taken the petition under advisement.

### Company's Action Misunderstood

Mr. Williams took occasion to assure the Councilman on April 28 that the company's actions had been misunderstood, and that all it intends to do is place the controversy in the hands of unbiased persons. Some solution of its difficulties must be obtained, he said, for the good of the people of Richmond more than the good of the stockholders. Should the commission's decision be unacceptable to the city, he said the city could go to the Supreme Court with it.

City Attorney James E. Cannon told the Council that he has prepared a tentative draft of a franchise and has it ready to present to the committee, but that until the commission has acted it is useless to take up the matter. He said it looked as though the company is going over the head of the city in its action in disregard of its franchise and he asked that the paper be tabled indefinitely. This was done.

In some quarters it is accepted that action of the company in going to the commission at this particular time assures the passage of an ordinance now before the body giving the Richmond Rapid Transit Corporation, operating a bus line, the right to return to Broad Street, the main thoroughfare of the city, from which it was ousted more than a year ago.

The Richmond Rapid Transit Corporation has assured the merchants on the streets where it operates at present that the company will not discontinue present service, but will add buses and operate two lines, one on Broad and the other on Grace Street.

W. F. Jenkins, associated with Richmond's first electric railway developments, has indicated that he and associates will be bidders for the Broad Street franchise, the principal grant under which the Virginia Railway & Power Company is operating. This franchise expires next year. Mr. Jenkins signified his intention to bid in a letter sent to the City Council on April 27.

# Hearings Held on Springfield and Worcester Wages

At the arbitration hearings in the case of the Springfield and the Worcester Consolidated Street Railways, employees of which are seeking an increase in wages and an eight-hour day, arguments were made on April 25 by Attorney James H. Vahey for the men and Attorney Bentley W. Warren for the company, before Lewis C. Parker, neutral arbitrator. Briefs were to be submitted on May 2, it was stated, and the first conference of the board is expected to be within a few days. In all the board is called upon to decide thirty-three points. With a nine-hour day and a spread of twelve hours in force, the men seek an eight-hour day within an eleven-hour spread.

In his closing remarks Mr. Warren said that if the employees accept the present hours the companies are willing to cut the bonuses and continue the present wage rate of 58 cents an hour, but if the nine-in-eleven day be adopted the wage rate should be reduced to 53½ cents in Springfield and 52¼ cents in Worcester. An alternative would be to cut out all bonuses, which for a nine-in-eleven day, he said, would bring wages below 50 cents an hour unless the Worcester and Springfield publics are to be burdened more than other communities.

Attorney Vahey argued for a wage scale as high as or higher than that in force previous to the Storrow award of 1922, and also for a reduction of hours. Taking of evidence occupied about fifteen days and covered a wide field, including comparative wage scales, cost of living statistics, budgets, costs of operation, and so on.

Prof. Albert S. Richey, Worcester, for the companies, testified that wages on these lines were higher than the average. Howard R. Whitney, vice-president, testified that the grand total of the payroll is $1,832,789, for the two companies, and an increase of even 1 cent an hour would cost the Springfield company $31,523 a year and the Worcester company, $37,374.

# Rerouting and Trackless Trolley Project Under Way in Toledo

The City Council at Toledo approved three more of Commissioner Cann's proposals incident to a general rerouting of traction lines in Toledo. The most important is the establishment of a trackless trolley line on Bancroft Street from Ottawa Park to Cherry Street, at a cost of $74,500. This service is planned to have seven trolley buses in operation at maximum and give five and one-half minute service. The Michigan Avenue line was abandoned and the Erie Street line rerouted. Through the changes in the Bancroft line the south portion of its belt will be linked with the northern part of the Short Belt to form a new line which will serve both sections and enable considerable service to be eliminated. No action has been taken on the elimination of the Indiana line, but it is expected that it will soon be cut away from the present system. Its elimination is estimated to save $58,000 a year and the elimination of the Michigan line will make a saving of about $8,800 annually. It is believed that the sale of $101,000 of preferred stock for the double-tracking of Sylvania Avenue will be undertaken soon in order to provide the funds for the work ready to go forward now.

## Commerce Body Against Buses

The Chamber of Commerce of Boone, Iowa, has adopted a resolution recommending that business men not lend encouragement to the Union Bus Service, which plans to run between Boone and Des Moines, via Luther. The chamber recites that adequate transportation service is maintained between Boone and Des Moines by the Fort Dodge, Des Moines & Southern Railway, an electric line, which runs a two-hour service, and by the Northwestern and the Milwaukee steam lines.

## Railway Proclaims Dependability of Its Bus Service

In a statement addressed to its patrons the Connecticut Company, New Haven, calls particular attention to the dependability of its bus service during the past winter. The company says:

"During the past winter from Dec. 1, 1923, to March 31, 1924, the buses of this company operated a total of 37,700 hours with a loss in time of only ninety-two hours due to mechanical troubles or bad road conditions.

"This demonstrated reliability of our bus service is of great importance to the traveling public."

## Traffic Conference in New York in May

The mayors of 411 cities and towns in New Jersey, New York and Connecticut within a radius of 50 miles of New York City and the presidents of 950 civic organizations have been invited to participate in a conference on the traffic problems of this area which is to be held at the Town Hall in New York City beginning at 10:30 a.m. on May 20.

The call for the conference points out that every city in the region of New York is facing the difficult task of handling not only its own constantly increasing local traffic but also that which flows daily to and from the larger cities in the region, particularly that which originates in or is bound toward New York City. The situation, says the invitation to mayors, calls for immediate relief of present congestion and for wise planning to prevent worse conditions in the future. It is already a question whether the congestion of traffic outside of Manhattan is not greater than that in Manhattan.

The conference will consider not only the congestion of traffic, but the traffic accident situation, traffic costs, convenience of travel within the region of New York (or lack of it), the adequacy of existing bridges, tunnels, streets and highways, the probable future need for wider, more numerous and differently located traffic arteries, and the whole relation of traffic problems to the contemplated regional plan of New York and its environs.

## Congestion Reduced

### New Traffic Regulations in Buffalo Speed Up Traffic—No Parking in Downtown Area

Two new traffic ideas put into effect in Buffalo, N. Y., have reduced congestion in the downtown retail shopping zone and have speeded up the movement of street cars and other vehicles in four parallel streets in the business section of the city. One of the new traffic ideas is the enactment of a no-parking ordinance affecting practically the entire down town business area. Recommendations for the enactment of this ordinance were made in a report submitted to the municipal authorities by the traffic committee of the Chamber of Commerce. The second traffic idea is the installation of an automatic electric signal system along Main Street from Swan to Tupper Street, a distance of almost 1 mile.

### Measure Very Helpful

The no-parking ordinance was enacted and put into successful operation despite the objections raised by Main Street merchants and property owners, who argued that the plan would drive business from Main Street department stores and office buildings to community trade centers in outlying parts of the city where motorists and others could park their cars without fear of arrest. Under the no-parking ordinance, automobiles cannot be parked along Main Street or any parallel or intersecting thoroughfare within two blocks east or west and the north and south limits extend for about one-half mile, taking in the entire downtown business zone of the city. Certain areas have been designated by the municipal authorities as parking spaces and the erection of a large number of new garages provides adequate parking space for motorists who bring their cars into the retail shopping zone of the city.

Under the old traffic ordinances, parking on Main Street was prohibited but motorists used parallel and intersecting streets for all day parking without restriction. This tended to delay the movement of street cars and often interfered with the operation of fire and other emergency vehicles.

### Signals to Be Installed Similar To Those in Detroit

The new automatic electric signal system installed along Main Street is similar to that in use in Detroit. Its operation has speeded up the movement of street cars and other vehicles. The speed limit of 15 m.p.h. in the congested district of the city has been lifted and motorists can now travel from 20 to 25 m.p.h. through the signaled zone.

The plan provides for red, yellow and green electric lights at every street intersection. Red lights indicate traffic must stop, yellow indicates a change is to be made in the lights and green lights indicate traffic can move. The green or clear signal allows traffic to move one minute along Main Street while one-half minute is given for traffic to cross Main Street. A gong is made to sound whenever the signals change. Left-hand turns are prohibited in Main Street. Mayor F. X. Schwab already has recommended to the City Council that the same type of signal system be used on Delaware Avenue, a parallel street which has become a motorists' boulevard with a serious traffic problem.

## Prole Rebate System to Be Tried in Long Beach

The Prole system of rebates for fares went into effect in Long Beach on April 28 on the lines of the B. & H. Transportation Company. Each purchaser of a 5-cent fare receives a transfer bearing two 2-cent coupons, redeemable as cash at the rate of one coupon to each 25 cents of cash purchase by the merchants listed on the back of the transfer and any other merchants who choose to redeem them. The Prole system has been approved by the Railroad Commission. Arrangements have been made for a ninety-day trial period. The rebate fare system, founded by W. A. Prole, is known as the Prole Transfer System and has been patented as such. The plan provides for the giving of transfers from 9 a.m. to 4.30 p. m. and from 6.30 p. m. to midnight every day except Saturday and Sunday. According to Mr. Prole, the system will reduce the congestion during the early morning hours and evening rush hours and will tend to increase patronage during slack hours.

## One-Man Cars Restored in Toledo

One-man cars were again put in service on the Bancroft line in Toledo by the Community Traction Company, on Sunday, April 27.

"The purpose of putting on the one-man cars is to reduce operating expenses," declared President B. C. Adams, in making his announcement. "We want the lowest possible fare in Toledo and that means we must have the lowest possible operating cost. On this line alone, one-man cars will mean a saving of $25,000 a year in expense."

Ten cars of the 600-type have been converted for one-man operation. They are entered at rear and passengers pay as they leave by the front door. There are no rear doors.

The present agreement with the union covers one-man operation by providing additional pay of 5 cents an hour for the operators.

The City Council at Toledo banned the one-man cars from this and two other routes in October, 1922, but it has since developed that the resolution was not a complete prohibition against the present use of the equipment.

Under Section 14 of the Milner ordinance the company also has rights in the way of changing service in the interest of economy and of resisting efforts of the Council to change service requirements when they would cause added expense. Disagreements are subject to arbitration. Although Council at a recent meeting ordered legislation prepared to oust the one-man cars from the Bancroft line, it is doubtful if this legislation will be enacted.

## Will Develop Business

### Michigan Railroad Joins with Bus and Truck to Increase Freight and Passenger Facilities

By joining forces with a bus and truck company for transportation in a 26-mile gap between Owosso and Flint, Mich., the Michigan Railroad will save hundreds of miles of freight carriage and will develop a passenger service not now enjoyed by the company. This statement was recently made by F. W. Brown, Grand Rapids, transportation superintendent. Formerly all freight for Flint and points north had to pass by way of Detroit. Negotiations now are practically completed and as soon as schedules can be made and other details arranged the freight and passenger service over this route will begin.

The bus service in question now operates between Lansing and Flint, but officials of this firm have said they will be glad to shorten their lines in order to enjoy the increased service the railway would make possible. The railway, according to Mr. Brown, plans to sell through passenger tickets across this gap as well as quote freight rates to Flint by way of Owosso from any point on the road. This is done now, but the cars must pass on two sides of a triangle with approximately 50-mile legs, while now they will go direct.

### De Luxe Buses Will Meet Cars

The truck company agrees to have buses of the Pullman type meet cars at Owosso and at Flint. The railway will run four limiteds each way daily and will offer competition for the only other means of transportation between Lansing and Flint, the Grand Trunk Railway. The bus line will not compete as it agrees to co-operate with the railroad. Officials express themselves as being extremely glad to take up the more frequent short hauls instead of the more than twice as long haul now made. Prices for both passenger and freight rates will be competitive from all points, Mr Brown said.

At present a huge freight traffic daily passes between Lansing and Flint and Jackson and Flint. Flint is a city in which thousands of automobiles are turned out each week and parts in great quantity are sent by way of interurban both from Jackson and from Lansing. The Jackson freight was taken the 100-mile trip by way of Detroit, while the Lansing freight for the most part went to competitive lines, since the railway had no connections direct. Now by means of the truck service these automobile parts can be transported cheaply and speedily to their destination. Mr. Brown now is considering methods of transporting the freight. Containers have been considered favorably, but perhaps more favor has gone to collapsible racks which can be folded into a small space when there is no return cargo to require their use, as will be the case with a certain amount of the traffic.

Mr. Brown has been working intensively along truck-bus-interurban schemes for some months and also has under consideration a plan whereby trucks in various cities could work under contract, as will the Owosso-Flint line, and would deliver direct to and from the railroad cars and various industrial plants. This plan is nearing the workable stage.

## Oakland's One-Man Cars Reassigned

One-man cars have been taken off Telegraph Avenue in Oakland, Cal. This removes all the one-man cars from Oakland with the exception of those on short feeder lines. The feeder lines, however, never figured in the controversy that has raged since last October.

W. R. Alberger, general manager of the Key System Transit, says the cars will be used on Ashby Avenue and Dwight Way in Berkeley. He explained that the company has only a limited number of these cars and that they are all needed in Berkeley, where they are being put on six months' trial beginning May 1.

Mayor Davie has sought to construe this action by the company into a personal victory for him. It will be recalled that last October an ordinance was passed against the use of one-man cars in Oakland, but that the city never exercised the police power under this measure. The Mayor now points out that forcible action on the part of the the city against the one-man cars would have been welcomed by the company, as it would have enabled it, in his opinion, to put the matter in the courts, resulting in years of litigation. He says that to his mind the action of the company "indicates that the Key System officials realize that they can no longer defy public opinion and the duly constituted authorities of the city of Oakland."

The company ignored the order forbidding operation of this type of cars, having been advised by the State Railroad Commission that the cars had its approval. No attention was paid by the company to threats to use force. Then the Mayor, backed by Commissioner Moorehead, put the city officially into the transportation business as a competitor to the Key System by acquiring a bus. This vehicle was run at a 5-cent fare as compared with 6 cents charged on the street cars. It was shifted to various routes as the weeks went by. Efforts made to secure other buses were defeated by vote of the City Council. The Rosalie, as the bus was known, ran four months and then was taken off because the City Auditor ruled that the city coach had been illegally acquired. He refused to pay the bill covering the cost of the bus.

The scene of one-man car activity now shifts to Berkeley. That city has voted to put the cars on probation for six months. This was agreed to some time ago, but there has been considerable delay, owing to the fact that the company, by the terms of the agreement with the city, was compelled to install a number of automatic street safety devices. This work has now been completed and it was expected the cars would run on May 1.

Pending the outcome of the Berkeley experiment the company is acquiring no new cars of the one-man type. There are not more than fifty of these, although there are some of the newer one-man, two-man type.

## Detroit Refuses to Deal with Union

The demands of the employees of the Detroit Department of Street Railways for an average wage increase of 14 per cent have been presented to Ross Schram, assistant general manager, and referred by him to the Street Railway Commission. The commission has taken the stand that it will deal only with committees representative of the trolley workers, elected in its own carhouses. The proposition of the commission provides that a committee selected by all employees meet with the commission and its statisticians and auditors to formulate an adequate wage scale and proper working conditions.

Union officials express the belief that an agreement can be reached without friction, but that the men are prepared to resort to arbitration. The commission called 106 platform men, selected on a seniority basis, to confer with its members and the assistant general manager. It was cited that the demands for the increase in wages and for modified working conditions were presented on stationery of the Amalgamated Association, but that the city could not deal with a union. The wage increases asked would amount to about $80,000 annually, approximately the present net income of the railway.

Union officials say that the procedure they are following was agreed upon by the commission on Feb. 7, 1923, and that if the commission holds out for any other form of procedure it is violating that agreement.

The D.S.R. has decided that if an employee permits the deduction from his wages of the same amount as the union he will be insured for $2,000 in case of death and $15 a week after the first week in case of sickness or accident. A blanket policy covering all platform men who have been in the employ of the department six months has been put into effect.

## Abandonment and Consolidation Authorized in Mobile

The Alabama Public Service Commission, on April 19, authorized the Mobile Light & Railroad Company to take up its tracks and to abandon service on certain streets, to lay tracks and furnish service on certain other streets and to rearrange and consolidate its service. The commission held that when it is shown a railway fails to earn a fair return on its investment, and such failure is not its fault, the utility should be allowed to rearrange and consolidate its service, if such changes give promise of resulting in substantial reduction of operating expenses, without serious impairment of its public service.

## Zone Fares Increased

The Board of Public Utility Commissioners of New Jersey has granted permission to H. H. Parmlee, as receiver of the North Jersey Rapid Transit Company, operating in Bergen County, to charge a 10-cent fare in each zone. There will be a 6-cent fare for school children and a 7-cent fare where tickets are bought in books. The company went into receivership in April, 1912.

# News Notes

**Buses Will Be Regulated.**—The bus problem at Newcastle, Ind., at last has received recognition on the part of the City Council in the introduction of an ordinance recently providing for the regulation of buses. The city is given the right to fix schedules and routes through the board of safety, the action to be ratified by the City Council. Buses on given routes will be limited in numbers and signs will be used to show the streets traveled. A penalty of a fine of $100 is provided for violation of any of the provisions of the ordinance.

**Planning to Restore Jitneys.** — An ordinance aimed to restore jitney service in Port Arthur, Tex., was read for the first time before the City Council by City Attorney Wistner recently. Some time ago the Mayor introduced and passed a resolution which would have the effect of opening all the streets of the city for the operation of jitney lines. This action was the outcome of negotiations with the management of the Port Arthur Traction Company in an effort to obtain further railway extensions. The situation in Port Arthur has attracted considerable attention from owners of jitney equipment in Port Arthur itself and also from outside sources. It is said that a number of Houston jitney men are planning to enter the service in Port Arthur when it is restored.

**Will Arbitrate Wages.**—Employees of the Wheeling Traction Company, Wheeling, W. Va., are seeking an increase in wages of 2 cents an hour. The company offered an increase of 2 cents, but this was rejected. The present wage scale is from 49 cents to 57 cents maximum. Arbitration will likely settle the controversy.

**Stages Will Serve Short Hauls.**—The Southern Pacific Company, operating in Oregon, has recently announced that three of its short-haul lines will be served in the future by automobile stages, to replace the present railway service. The lines affected are the Salem-Black Rock branch, 25 miles long; the Whiteson-Willamina branch, 20 miles long, and the Woodburn-Silberton line, 10 miles. The company will not own the stages, but will handle the passenger business on the same schedules as at present through traffic agreement with the existing stage lines.

**Buys Bus Lines.**—The Northern Ohio Traction & Light Company, Akron, Ohio has purchased two independent bus lines—the Northeast and Gregory—in Akron. There are three buses in each line and both operate into the Northeast and Goodyear Heights section of the city. The Northeast has been in operation several years, the other only a few months. The newly acquired lines will be operated as a part of the traction company's city system. These, with the buses recently purchased, and the ones in operation give the company a fleet of sixty city buses in Akron.

**Company Wants Cut—Men Seek Advance.**—The employees of the Stark Electric Railroad, Alliance, Ohio, have rejected the company's suggestion of a 10-cent cut in wages effective with the signing of the new scale on May 1. The men want an increase of 9 cents an hour and a continuation of the present working agreement.

**Will Operate Buses in Germantown Soon.**—The Philadelphia Rapid Transit Company, Philadelphia, Pa., will be ready to operate a bus line in Germantown ten days after the City Council passes an ordinance granting a franchise for the proposed line, according to the statement made by the company to W. D. B. Ainey, chairman of the Public Service Commission. J. A. Queeney, president of the Philadelphia Rural Transit Company, a subsidiary of the railway company, testified before the commission that in the event of a temporary certificate being granted the company would operate a fleet of buses which would provide ample facilities for that section of the city. The fare would be 10 cents with an exchange system from the buses to the cars, operated in Germantown by the Philadelphia Rapid Transit Company, by the payment of an additional 3 cents.

**Full One-Man Operation on Suburban Line.** — The Morris County Traction Company, Morristown, N. J., is now entirely operated with one-man cars (converted), no safety appliances being used at this time. The company's main line operates through ten zones and identification checks are issued to passengers. This has worked out well and no delays of any kind have been experienced. Schedules operated are the same as those with two men. Operation is through thickly settled suburbs. An average speed of 12.9 m.p.h. is obtained. On the Dover-Hopatcong line there are two railroad crossings at grade. The derails at these points have been electrified, Cheatham electric deraling device being used. The installations at these points have been approved by the Board of Public Utility Commissioners.

**Fare Will Be Lowered.**—Railway fare on the pier line, running from the Public Square to the East Ninth Street docks, in Cleveland, will be reduced from 6 cents to 2½ cents, according to a recent announcement of John J. Stanley, president of the Cleveland Railway.

**Time Extended on Fare Change.**—The Key System Transit Company, Oakland, Cal., has been granted an extension of time by the Railroad Commission until May 4, 1924, in which to remove the discrimination in interurban fares and service now existing against the city of Piedmont, as heretofore ordered by the commission. The matter has been referred to previously in these columns.

**Fares Increased.**—The Androscoggin & Kennebec Railway, Lewiston, Me., recently received permission from the Public Utilities Commission to file a new schedule of passenger rates in which the cash fare for a single zone ride will be 10 cents instead of the present 9-cent charge. Students' tickets in books of 100 coupons will be sold for $5.

**Fares in Hornell Approved.** — The Public Service Commission has approved the application of the Hornell Traction Company, Hornell, N. Y., to try reduced fares for a period of ninety days. Instead of the 8-cent fare which has been in effect, a 7-cent fare will be charged in Zone 1 (within the city of Hornell and from Hornell to Glenwood Park) or between any two points within Zone 2 (all stops between Glenwood Park and Canisteo). Metal tickets will be sold at the rate of twenty for $1 and ten tickets for 50 cents. A twenty-ticket book will be sold for $1.40, good in either direction between Canisteo and Crittendon. An account of Hornell's fare difficulties was published in the ELECTRIC RAILWAY JOURNAL, issue of April 26.

**Tramway Men Petition.**—Employees of the Montreal Tramways, Montreal, Can., are seeking the return of the 1920-21 conditions which were terminated in July 1921 when a 12½ per cent reduction in wages was put into effect. The present demand therefore is for an increase of 12½ per cent on the existing rates of pay. The men's representatives have been instructed to interview the company with a view to obtaining a definite reply on the wage schedule proposals and also on the pension scheme. Four thousand tramway employees are effected by the outcome of the wage matter. It is believed that the company favors the proposition of the men that an employee shall be eligible for a pension after twenty years service or upwards.

**Hears Abandonment Petition.**—The petition of the Chautauqua Traction Company, Jamestown, N .Y., to abandon its line between Mayville and Westfield had its final airing before the Public Service Commission on April 25. Briefs are to be filed in two weeks by attorneys for the company and the village of Mayville, which opposes the proposed abandonment. The company showed that there has been very little business in passenger service between Mayville and Westfield in many years. Testimony was introduced by the Company to show that it was feasible to utilize other transporting means for the patrons of the line.

**Wants Relief from Superior.** — An ultimatum has been delivered to the City Council of Superior, Wis., by the Duluth Street Railway threatening the establishment of one-man car service through an appeal to the commission unless the city immediately takes the proper steps to pass two proposed ordinances covering the halting of street cars at railroad crossings and charging bus companies a license fee for operating in Superior. Such relief was promised the railway by the Council on Sept. 15, 1923, in return for the company's agreement on fare rates providing a 10-cent straight cash fare and five tickets for 30 cents, thus maintaining the old 6-cent fare. The company states in its communication to the Council that during the past several months it has continued to do so as long as the city fails to grant the necessary relief. The annual report of the Superior division of the Duluth Street Railway for 1923 shows the company suffered a net deficit of $10,396.

# Foreign News

## London Traffic Bill Introduced

### Plan Would Create Committee with Control Over All Local Carriers and Traffic

The London traffic bill, introduced in Parliament by the British government, provides for control over an area covering a radius of 25 miles from Charing Cross. It is intended that the Minister of Transport, acting through an advisory committee, will have power to prohibit all wasteful competition, and to make regulations on a wide variety of subjects. These regulations will have to be submitted to Parliament.

Two points which may be referred to the advisory committee have special interest as bearing on bus competition with tramways and railways. One is the co-ordination of all or any of the various forms of transport services, and co-operation between the persons operating the same or different forms of transport services with a view to combined operation in the best interests of the public. The other is to decide on the comparative desirability of different forms of transport services in various circumstances, either generally or in any specific case.

### BUS PROHIBITION IN MINISTER'S HANDS

Bus licensing authorities are to have power to define the routes taken by buses, to require that a bus shall not ply for hire unless it maintains a regular service, and to specify the number of buses to be used on any given route. The Minister may prohibit or restrict bus traffic in streets where he considers such a course justified by width of the street, traffic density, or the existence of alternative facilities. Expenses incurred under the bill are to be met out of the road fund. There will be no charge on the ratepayers or the taxpayers.

The bill is rather complicated and provides among other things for restrictions on powers to break up street surfaces. The government believe that its operation will help buses, tramways and underground railways to pay their way.

The introduction of the bill in Parliament was hastened by the troubles incident to the London tramway men's strike. The court of inquiry which the government had set up reported that the claim for increase of wages was not seriously questioned. The crisis had arisen through the London tramway undertakings being unable to earn sufficient to meet this claim. This had been brought about by the severe competition of buses in the absence of any co-ordinating control, by the heavy expenditure on renewals and upkeep of permanent way at present high costs, and by the discharge of the statutory obligations for the maintenance of the surface of the highway.

All parties expressed the view, with which the court concurred, that without some co-ordinating control of passenger traffic there was little if any prospect of improvement in the condition of the industry. An undertaking by the government to press forward legislation placing the passenger traffic of the metropolitan area under some co-ordinating control afforded, in the court's view, a basis, and the only one at present suggested, for reopening negotiations between the parties.

The London traffic bill, based on this report, was debated in the House of Commons on March 28, when the second reading was carried by 211 votes against 112. The opposition came from the Liberal party, though some of the Labor men also opposed. The ground of objection was that the bill would set up a bureaucratic control and would favor a monopoly of the "combine" of the underground railway, bus and tramway companies. This objection was based on the composition of the committee, the appointment of which the bill proposes, to advise the Minister of Transport. This committee would consist of a chairman, twelve ordinary members representing local authorities, government departments and the police, and six additional members, two of them representatives of labor and four of commercial transport interests. Only on subjects directly concerning them are the six additional members to be called into council.

The London County Council and other local authorities in the metropolitan area, as well as the Labor interests, are conducting an agitation in favor of making the advisory committee entirely a municipal and state body. On the other hand, bus and commercial motor interests oppose the scheme on the ground that it gives too much power to the municipal interests.

## Bordeaux Trams and Buses to Extend

The report of the Compagnie Française des Tramways Electriques et Omnibus de Bordeaux for 1923, published recently, takes account for the first time of the agreement with the city by which the fares of the urban sections were increased 25 per cent. Of the sums so received two-fifths is to be applied to the reduction of the deficit accrued during former years and three-fifths for new track and rolling stock equipment.

During 1923 there were issued 10,000 bonds of 500 francs each bearing 6 per cent interest. This netted 4,750,000 francs, which was also in a large measure expended in re-equipment, including the building of a substation. There was expended for new rolling stock a sum of approximately 1,300,000 francs.

In addition large suburban extensions were undertaken, including electrifying the lines from Bordeaux to Pessac and Allouette and from Bordeaux to Léognan. A new line is in course of construction from Bordeaux to Bouscat and a new car shop has been constructed at Pont-de-la-Maye. The departmental, or county, government, has advanced for these suburban lines a sum of 5,000,000 francs.

This is considered one of the most important extensions of urban and suburban electric car services undertaken by any French municipality since the war.

## Cork-Screw Railway for Paris

Another idea has been put forward for handling short-haul passenger traffic in Paris. This time it is proposed to propel a series of close-coupled cars by an underhung screw, or worm. This is similar to a project which, it is announced, is to be operated in London during the summer at the Wembley Exhibition. The idea seems to have pleased the fancy of the French and estimates have been made that from the crowded centers of the Place de l'Opera to the Place de la Concorde, to the Palais Royal and to the Port Saint Denis 16,000 passengers per hour could be handled by eighty cars as a maximum, the distance to be covered in each trip being not more than 2,000 m. (6,600 ft.). This gives 200 passengers to the car per hour.

## Handling London Traffic During the Strike

The recent strike of tramway and bus employees in London, which terminated on April 1, crippled the transportation facilities to the extent of shutting down all regular local service except the tubes and the suburban branches of the main line railways. Some indication of what the strike meant to the underground companies, is revealed in the following figures: The week's passengers including tramway and bus lines, dropped from 35,000,000 to 8,000,000, but the railways carried 4,000,000 passengers, exclusive of season ticket holders, over a normal week. On Wednesday, the heaviest day on the tubes, nearly 1,250,000 passengers were carried.

Owing to the circumstances prevailing, the underground companies were unable to put a single extra train into service; neither were they able to make any increase in the staff. The automatic ticket machines were of considerable assistance in easing the booking office situation. The bank of machines at Victoria station issued 25,000 tickets daily as against 7,000 tickets on a normal day. On the first day of the strike, half a ton of coppers was collected from this station alone.

The chief difficulty, apart from the handling of the crowds, was the high proportion of short distance riders who were new to the underground railways and added to the difficulties of the staff by asking questions rather than paying heed to the direction notices.

The new trains on the District Railway and Piccadilly tube showed the three wide center doors to be of paramount importance in handling dense crowds. The trains frequently had loads of 1,000 passengers apiece.

# Financial and Corporate

## Another Suit in Connection with St. Louis Reorganization Affairs

A plan of reorganization for the United Railways, St. Louis, by which the St. Louis Transit Company 5 per cent bonds would be foreclosed and the United Railways general 4s would be validated and continued until their maturity ten years hence, has been suggested in a suit which Samuel W. Adler, New York, has filed in the United States District Court at St. Louis. Mr. Adler holds approximately $135,000 of the St. Louis Transit Company 5s, of which the total issue now outstanding amounts to $10,000,000. He was the plaintiff to the suit under which the present receivership of the United Railways was decreed.

In his new suit Mr. Adler asks that the several trustees under the mortgages be enjoined temporarily from prosecuting foreclosure suits until final decree shall be entered, determining the respective priorities and equities of the securities of the United Railways properties. He asks further that the St. Louis Union Trust Company as trustee under the $30,300,000 issue of general 4s be "temporarily restrained from claiming or asserting that the bonds have matured."

The theory of the Adler suit is said to be that when the court determines the priority of the various liens against the United Railway properties they will rank as follows: First, the $4,200,000 of receiver's certificates; second, the underlying bonds; third, the general 4s, the St. Louis Transit 5s and then the other outstanding securities.

If the court should issue the orders requested in the suit the receiver's certificates and the underlying bonds would be paid off and the general mortgage 4s, now in default because of nonpayment of interest, would be reinstated and extended for ten years as a first mortgage. The Transit 5s would then remain as the basis for the reorganization of the system, and the obligations of reorganization would devolve upon the holders of the Transit 5s.

## Charleston-Isle of Palms to Be Sold on May 7

Judge Henry A. M. Smith recently handed down a decree ordering the final sale of the property of the Charleston-Isle of Palms Traction Company, Charleston, S. C., at public auction on May 7. Recently P. R. Rivers, Charleston, was appointed receiver of the company by order of Judge Smith in Federal court upon petition of the Baltimore Trust Company, trustee, under the indenture securing $250,000 of 5 per cent bonds. The Sheriff of Charleston County on Feb. 21 seized the ferryboats and cars of the company under attachment proceedings. He was ordered to show cause why he should not be restrained from proceeding to advertise and sell that portion of the property which he seized. Arthur M. Huger, United States Commissioner, was named by Judge Smith in the order appointing a receiver as a special master in this matter. The property will be offered for sale by Mr. Huger.

If efforts should fail to sell the property as a whole the master will be prepared to offer it in three parcels; the first will be composed of the wharves and slips located in Charleston, office furniture, materials and supplies; parcel 2 will be comprised of the tracks of the Charleston-Isle of Palms Traction Company as they now lie, and parcel 3 will include the cables, lighting and power systems, poles and overhead wiring.

## Interpretation of Amended New York Law Causes Confusion

The Fearon bill, signed by Governor Smith of New York, amending the penal law and making it misconduct in office for an officer or director of a stock corporation to declare a dividend except from surplus instead of "surplus profits arising from the business," as formerly in the law, has caused discussion as to application.

The State Tax Commission held the opinion that the language of the law is simply changed and that no added meaning is had, as surplus always consists of profits. Other authoriities, however, declare that the changed wording permits the inclusion in surplus of unearned income such as enhanced value above the purchase price of realty, without the actual physical conversion of such property into cash so as to show a money profit, the contention being that the striking out of the words "profits arising from the business of a corporation" leaves the word "surplus" undefined, which of course would include unearned income.

Section 664 of the penal law relates to misconduct of officers and directors of stock corporations, and specifies what directors thereof may not do in the handling of the funds of such a corporation. The amendments would seem to affect particularly utility and insurance corporations.

## Net Income and Traffic in Detroit Fall Off Slightly

The Department of Street Railways, City of Detroit, during March, 1924, reports a total revenue from transportation of $1,988,878. In March a year ago this revenue was $1,755,955. The total operating revenue, which included the above-mentioned figures, was $2,031,930 and $1,851,535 for March, 1924 and 1923 respectively. Total operating expenses showed an increase from $1,339,794 in March, 1923, to $1,403,261 in March of the current year. The net revenue from railway operations was $628,669, against $511,741 in March a year ago. The net income varied very slightly. A year ago it was $98,025, and in March of the current year $97,180. In March this year 42,773,240 passengers were carried, compared with 43,227,300 in the corresponding month last year.

# All Records Smashed in 1923

### Electric Railways Carried More Passengers, Operated More Cars and More Car Miles, and Had the Greatest Gross Revenue in History of the Industry—Net Revenue Off Nine-tenths of 1 per Cent

REPORTS to the American Electric Railway Association from 400 electric railways representing more than 80 per cent of the whole industry show total passengers carried as 13,280,730,742 in 1923, compared with 12,822,423,121 in 1922, an increase of 3.6 per cent. Applying this increase to the total for the whole industry as reported by the United States Census Bureau in 1922 nearly 16,000,000,000 passengers were carried by the traction lines in 1923.

The total revenues reported by the 400 reporting companies was $781,186,841 in 1923 and $762,805,840 in 1922, an increase of 2.5 per cent. Operating expenses increased 3.6 per cent, from $558,547,354 in 1922 to $578,763,453 in 1923. In consequence of the greater increase in the expenses compared with the revenues the operating ratio rose from 73.2 per cent to 74.1 per cent, an indication that operating conditions were not so favorable in 1923 as they had been in 1922.

Edmund J. Murphy, chief statistician of the association, writing in *Aera* for May, says the principal causes of these unfavorable conditions were the slightly lower rate of fare prevailing in 1923 and the higher cost of operation, brought about chiefly by increased labor costs and in lesser degree by increased commodity prices. According to Mr. Murphy there is also evidence that slightly more service was given in proportion to the traffic than in 1922. This also operated to increase the operating ratio. The net revenue, in consequence, fell off. In 1922 it was $204,258,486, while in 1923 it dropped to $202,423,389, a decrease of 0.9 per cent.

In the accompanying tables data are given for 288 companies. The other 112 companies could not be included because in some cases they could not segregate their railway taxes and fixed charges from their light and power business and in other cases their fiscal year does not coincide with the calendar year on which the tables are based. This smaller group operates 25,219 miles of single track and represents approximately 60 per cent of the whole industry.

The operations of this group follow the same general trend as the larger group. The number of revenue passengers increased 3½ per cent, transfer passengers increased 2.45 per cent and total passengers, including free passen-

## Statistics Compiled by American Electric Railway Association

### TABLE I—COMBINED INCOME STATEMENT OF 288 RAILWAYS

| | 1923 | 1922 | Increase or (D) Decrease | Per Cent Increase or (D) Decrease |
|---|---|---|---|---|
| Railway operating revenues | $549,825,275 | $538,756,193 | $11,069,082 | 2.05 |
| Railway operating expense | 412,455,676 | 397,729,646 | 14,726,030 | 3.70 |
| Net operating revenue | $137,369,599 | $141,026,547 | (D) 3,656,948 | (D) 2.59 |
| Net revenue: Auxiliary operations | 23,924,788 | 21,196,178 | 2,728,610 | 12.87 |
| Taxes | 36,210,928 | 35,428,696 | 782,232 | 2.21 |
| Operating income | $125,083,459 | $126,794,028 | (D) 1,710,569 | (D) 1.35 |
| Non-operating income | 13,295,850 | 12,327,856 | 967,994 | 7.85 |
| Gross income | *a*$138,448,406 | *b*$139,136,987 | (D) 688,581 | (D) 0.50 |
| Deductions from gross income | 99,711,148 | 99,724,713 | (D) 13,565 | (D) 0.01 |
| Net income | $38,737,258 | $39,412,274 | (D) 675,016 | (D) 1.71 |
| Operating ratio (per cent) | 75.0 | 73.8 | 1.2 | 1.62 |
| Ratio: Net income to operating revenue | 7.04 | 7.31 | (D) 0.27 | (D) 3.69 |
| Miles of single track | | | | |

*a* Includes $69,097 equalization income. *b* Includes $15,103 equalization income.

### TABLE II—COMBINED INCOME STATEMENT (ON A CAR-MILE BASIS) OF 288 RAILWAYS

| | 1923 (Cents Per Car Mile) | 1922 (Cents Per Car Mile) | Per Cent Increase or (D) Decrease |
|---|---|---|---|
| Railway operating revenues | 44.8 | 45.3 | (D) 1.0 |
| Railway operating expense | 33.6 | 33.4 | 0.7 |
| Net operating revenue | 11.2 | 11.9 | (D) 6.0 |
| Net revenue: Auxiliary operations | 1.9 | 1.8 | 8.5 |
| Taxes | 2.9 | 3.0 | (D) 1.5 |
| Operating income | 10.2 | 10.7 | (D) 4.5 |
| Non-operating income | 1.1 | 1.0 | 10.0 |
| Gross income | 11.3 | 11.7 | (D) 3.5 |
| Deductions from gross income | 8.1 | 8.4 | (D) 3.5 |
| Net income | 3.2 | 3.3 | (D) 3.0 |

### TABLE III—OPERATING EXPENSES (BY PRIMARY ACCOUNTS) OF 288 RAILWAYS

| | 1923 | 1922 | Increase or (D) Decrease | Per Cent Increase or (D) Decrease |
|---|---|---|---|---|
| Way and structures | $62,668,050 | $59,626,816 | $3,041,234 | 5.10 |
| Equipment | 49,843,090 | 48,289,672 | 1,643,418 | 3.36 |
| Power | 61,756,842 | 60,424,384 | 1,332,758 | 2.21 |
| Conducting transportation | 173,640,168 | 167,410,301 | 6,229,867 | 3.72 |
| Traffic | 1,844,695 | 1,760,058 | 84,637 | 4.81 |
| General and miscellaneous | 57,390,451 | 54,843,356 | 2,547,095 | 4.64 |
| Transportation for investment—credit | —242,292 | —244,507 | (D) 2,215 | (D) 0.96 |
| Total operating expenses | *a*$412,455,676 | *b* $397,729,646 | $14,726,030 | 3.70 |

*a* Includes $5,554,672 of undistributed expense.
*b* Includes $5,619,566 of undistributed expense.

### TABLE IV—SIGNIFICANT RATIOS DERIVED FROM ACCOUNTS OF 288 RAILWAYS

| | 1923 | 1922 | Per Cent Increase |
|---|---|---|---|
| Railway operating revenue | $549,825,275 | $538,756,193 | 2.05 |
| Per mile of single track | $21,801 | $21,371 | 2.01 |
| Passenger revenue | $514,010,138 | $504,491,839 | 1.88 |
| Per revenue passenger | [1]7.1c | [1]7.2c | (D) 1.39 |
| Per total passenger | [1]5.7c | 5.7c | ........ |
| Per mile of single track | $20,381 | $20,011 | 1.84 |
| Per passenger car-mile | 43.9c | 44.0c | (D) 0.23 |
| Per car operated | [2]$15,785 | [2]$16,013 | (D) 1.43 |
| Per revenue car-hour | [3]$3.99 | [3]$4.07 | (D) 1.97 |
| Revenue passengers | [4]7,022,740,707 | [4]6,797,627,822 | 3.31 |
| Per mile of single track | [4]289,795 | [4]280,898 | 3.16 |
| Per passenger car-mile | [4]6.1 | [4]6.1 | ........ |
| Per car operated | [5]222,592 | [5]223,425 | (D) 0.38 |
| Per revenue car-mile | [6]57 | [6]58 | (D) 1.73 |
| Total passengers | [4]8,719,157,241 | [4]8,463,910,829 | 3.01 |
| Per mile of single track | [4]359,799 | [4]349,754 | 2.87 |
| Per passenger car-mile | [4]7.6 | [4]7.6 | ........ |
| Ratio: Transfer passenger to revenue passenger (per cent) | 21.0% | 21.0% | ........ |
| Car miles | 1,226,016,151 | 1,188,487,632 | 3.15 |
| Per mile of single track | 48,613 | 47,144 | 3.11 |
| Per car operated | [2]37,159 | [2]37,329 | (D) 0.46 |
| Per revenue car-hour | [7]9.30 | [7]9.38 | (D) 0.86 |
| Car hours | [8]115,531,437 | [8]111,051,112 | 4.02 |
| Per car operated | [9]3,986 | [9]3,970 | 0.40 |

[1] 281 companies. [5] 238 companies. [8] 250 companies. [2] 242 companies. [6] 247 companies. [9] 223 companies. [3] 254 copmanies. [7] 255 companies. (D) Decrease. [4] 280 companies.

### TABLE V—OPERATING EXPENSES (PER CAR-MILE) OF 288 RAILWAYS

| | 1923 | 1922 | Per Cent Increase or (D) Decrease |
|---|---|---|---|
| Way and structures | 5.1 | 5.0 | 2.00 |
| Equipment | 4.1 | 4.1 | ........ |
| Power | 5.0 | 5.1 | (D) 1.96 |
| Conducting transportation | 14.2 | 14.1 | 0.71 |
| Traffic | 0.1 | 0.1 | ........ |
| General and miscellaneous | 4.7 | 4.6 | 2.17 |
| Transportation for investment—credit | ..... | ..... | ........ |
| Total operating expenses | *a*33.7 | *b*33.5 | 0.59 |

*a* Includes 0.5 cent of undistributed expense.
*b* Includes 0.5 cent of undistributed expense.

### TABLE VI—OPERATING STATISTICS OF 288 RAILWAYS

| | 1923 | 1922 | Increase or (D) Decrease | Per Cent Increase or (D) Decrease |
|---|---|---|---|---|
| Passenger car miles | 1,178,000,332 | 1,144,459,363 | 33,540,969 | 2.93 |
| Total revenue car miles | 1,226,016,251 | 1,188,487,632 | 37,528,619 | 3.16 |
| Revenue passengers[1] | 7,022,750,707 | 6,797,627,822 | 225,122,885 | 3.31 |
| Transfer passengers[2] | 1,472,714,921 | 1,437,524,285 | 35,190,636 | 2.45 |
| Total passengers | 8,719,157,241 | 8,463,910,829 | 255,246,412 | 3.01 |
| Passenger revenue | $514,010,138 | $504,491,839 | $9,518,299 | 1.89 |
| Revenue car hours[3] | 115,531,437 | 111,051,112 | 4,680,325 | 4.03 |
| Miles of single track | 25,219.5 | 25,209.6 | 9.9 | 0.04 |
| Cars operated[4], *a* | 29,136 | 28,160 | 976 | 3.46 |

*a* Average maximum number of cars in service daily. [1] Reported by 280 companies. [2] Reported by 183 companies. [3] Reported by 254 companies. [4] Reported by 242 companies.

### TABLE VII—COMBINED INCOME STATEMENT OF 114 COMPANIES OPERATING CITY LINES EXCLUSIVELY

| | 1923 | 1922 | Increase or (D) Decrease | Per Cent Increase or (D) Decrease |
|---|---|---|---|---|
| Railway operating revenue | $364,781,419 | $358,173,520 | $6,607,899 | 1.84 |
| Railway operating expense | 267,978,621 | 259,282,083 | 8,696,538 | 3.35 |
| Net operating revenue | $96,802,798 | $98,891,437 | (D) 2,088,639 | (D) 2.11 |
| Net revenue: Auxiliary operations | 8,423,053 | 7,995,944 | 427,109 | 5.34 |
| Taxes | 24,451,773 | 24,012,492 | 439,281 | 1.83 |
| Operating income | $80,774,078 | $82,874,889 | (D) 2,100,811 | (D) 2.54 |
| Non-operating income | 4,213,444 | 3,952,831 | 260,613 | 6.59 |
| Gross income | *a*$85,056,619 | *b*$86,842,823 | (D) 1,786,204 | (D) 2.06 |
| Deductions from gross income | 62,217,683 | 62,152,667 | 65,016 | 0.10 |
| Net income | $22,838,936 | $24,690,156 | (D) 1,851,220 | (D) 7.50 |
| Operating ratio (per cent) | 73.5 | 72.4 | 1.1 | 1.51 |
| Ratio: Net income to operating revenue | 6.26 | 6.89 | (D) 0.63 | (D) 9.15 |

*a* Includes $69,097 equalization income. *b* Includes $15,103 equalization income.

### TABLE VIII—OPERATING EXPENSES (BY PRIMARY ACCOUNTS) OF 114 COMPANIES OPERATING CITY LINES EXCLUSIVELY

| | 1923 | 1922 | Increase or (D) Decrease | Per Cent Increase or (D) Decrease |
|---|---|---|---|---|
| Way and structures | $37,198,595 | $35,618,168 | $1,580,427 | 4.44 |
| Equipment | 32,303,575 | 31,768,689 | 534,886 | 1.68 |
| Power | 37,826,699 | 36,861,368 | 965,631 | 2.62 |
| Conducting transportation | 119,426,909 | 115,692,065 | 3,734,844 | 3.23 |
| Traffic | 595,883 | 662,011 | (D) 66,128 | (D) 9.98 |
| General and miscellaneous | 35,670,790 | 33,615,743 | 2,055,047 | 6.11 |
| Transportation for investment—Cr. | —154,531 | —135,623 | 18,908 | 13.94 |
| Total operating expense | *a*$267,978,621 | *b* $259,282,088 | 8,696,538 | 3.35 |

*a* Includes $5,110,701 undistributed expense. *b* Includes $5,199,662 undistributed expense.

### TABLE IX—OPERATING STATISTICS OF 114 COMPANIES OPERATING CITY LINES EXCLUSIVELY

| | 1923 | 1922 | Increase or (D) Decrease | Per Cent Increase or (D) Decrease |
|---|---|---|---|---|
| Passenger car-miles | 806,326,674 | 783,193,404 | 23,133,270 | 2.95 |
| Total revenue car-miles | 811,955,756 | 787,192,929 | 24,762,827 | 3.14 |
| Revenue passengers[1] | 5,411,344,990 | 5,232,073,596 | 179,271,394 | 3.42 |
| Transfer passengers[2] | 1,212,308,988 | 1,185,779,989 | 26,528,999 | 2.23 |
| Total passengers[1] | 6,830,404,389 | 6,626,922,391 | 203,481,998 | 3.07 |
| Passenger revenue | $355,465,052 | $349,445,992 | $6,019,060 | 1.72 |
| Revenue car-hours[3] | 79,808,224 | 76,507,341 | 3,300,883 | 4.31 |
| Miles of single track | 10,693.7 | 10,652.5 | 41.2 | 0.38 |
| Cars operated [4]*a* | 20,504 | 19,751 | 753 | 3.81 |

*a* Average maximum number of cars in service daily. [1] Reported by 110 companies. [2] Reported by 79 companies. [3] Reported by 109 companies. [4] Reported by 102 companies.

## TABLE X—INCOME STATEMENT OF 117 COMPANIES OPERATING INTERURBAN LINES EXCLUSIVELY

| | 1923 | 1922 | Increase or (D) Decrease | Per Cent Increase or (D) Decrease |
|---|---|---|---|---|
| Railway operating revenues... | $88,476,229 | $86,694,517 | $1,781,712 | 2.05 |
| Railway operating expenses... | 69,423,129 | 65,887,261 | 3,535,868 | 5.37 |
| Net operating revenue.... | $19,053,100 | $20,807,256 | (D) 1,754,156 | (D) 8.43 |
| Net revenue: Auxiliary operations.................... | 5,990,401 | 4,770,180 | 1,220,221 | 25.58 |
| Taxes...................... | 5,480,086 | 5,485,143 | (D) 5,057 | (D) 0.09 |
| Operating income........ | $19,563,415 | $20,092,293 | (D) 528,878 | (D) 2.63 |
| Non-operating income........ | 1,859,156 | 1,637,703 | 221,453 | 13.52 |
| Gross income............. | $21,422,571 | $21,729,996 | (D) 307,425 | (D) 1.41 |
| Deductions from gross income. | 15,581,821 | 15,504,302 | 77,519 | 0.50 |
| Net income............. | $5,840,750 | $6,225,694 | (D) 384,944 | (D) 6.18 |
| Operating ratio (per cent)..... | 78.5 | 76.0 | 2.5 | 3.28 |
| Ratio: Net income to operating revenue.............. | 6.60 | 7.18 | (D) 0.58 | (D) 8.08 |

## TABLE XI—OPERATING EXPENSES (BY PRIMARY ACCOUNTS) OF 117 COMPANIES OPERATING INTERURBAN LINES EXCLUSIVELY

| | 1923 | 1922 | Increase or (D) Decrease | Per Cent Increase or (D) Decrease |
|---|---|---|---|---|
| Way and structures......... | $12,504,460 | $11,551,472 | $952,988 | 8.22 |
| Equipment................ | 8,287,690 | 7,690,180 | 687,510 | 8.95 |
| Power..................... | 11,871,280 | 11,766,269 | 105,011 | 0.89 |
| Conducting transportation... | 24,657,575 | 23,121,068 | 1,536,507 | 6.64 |
| Traffic..................... | 862,346 | 782,719 | 79,627 | 10.18 |
| General and miscellaneous... | 11,138,137 | 10,905,925 | 232,212 | 2.13 |
| Transportation for investment—Credit........... | —47,842 | —74,390 | (D) 26,548 | (D) 35.70 |
| Total operating expense. | *a*$69,423,129 | *b* $65,887,261 | 3,535,868 | 5.37 |

*a* Includes $149,463 undistributed expense. *b* Includes $144,018 undistributed expense.

## TABLE XII—OPERATING STATISTICS OF 117 COMPANIES OPERATING INTERURBAN LINES EXCLUSIVELY

| | 1923 | 1922 | Increase or (D) Decrease | Per Cent Increase or (D) Decrease |
|---|---|---|---|---|
| Passenger car-miles......... | 172,805,765 | 168,294,873 | 4,510,892 | 2.68 |
| Total revenue car-miles...... | 194,617,639 | 187,882,163 | 6,735,476 | 3.58 |
| Revenue passengers[1]........ | 569,918,785 | 561,179,897 | 8,738,888 | 1.56 |
| Transfer passengers[2]........ | 73,229,866 | 71,719,079 | 1,510,787 | 2.11 |
| Total passengers[1]........... | 647,986,569 | 639,097,068 | 8,889,501 | 1.39 |
| Passenger revenue.......... | $69,094,473 | $67,266,869 | $1,827,604 | 2.72 |
| Revenue car-hours[3]......... | 13,161,796 | 12,658,500 | 503,296 | 3.97 |
| Miles of single track......... | 8,179.2 | 8,187.3 | (D) 8.1 | (D) 0.10 |
| Cars operated[4] *a*........... | 3,020 | 2,895 | 125 | 4.31 |

*a* Average maximum number of cars in service daily. [1] Reported by 114 companies. [2] Reported by 49 companies. [3] Reported by 93 companies. [4] Reported by 87 companies.

## TABLE XIII—INCOME STATEMENT OF 57 COMPANIES OPERATING COMBINED CITY AND INTERURBAN LINES

| | 1923 | 1922 | Increase or (D) Decrease | Per Cent Increase or (D) Decrease |
|---|---|---|---|---|
| Railway operating revenue. | $96,567,627 | $93,888,156 | $2,679,471 | 2.85 |
| Railway operating expense. | 75,053,926 | 72,560,302 | 2,493,624 | 3.44 |
| Net operating revenue | $21,513,701 | $21,327,854 | 185,847 | 0.87 |
| Net revenue: Auxiliary operations................ | 9,511,334 | 8,430,054 | 1,081,280 | 12.82 |
| Taxes.................. | 6,279,069 | 5,931,061 | 348,008 | 5.86 |
| Operating income..... | $24,745,966 | $23,826,846 | 919,120 | 3.86 |
| Non operating income..... | 7,223,250 | 6,737,322 | 485,928 | 7.21 |
| Gross income......... | $31,969,216 | $30,564,168 | 1,405,048 | 4.59 |
| Deductions from gross income................. | 21,911,644 | 22,067,744 | (D) 156,100 | (D) 0.71 |
| Net income.......... | $10,057,572 | $8,496,424 | $1,561,148 | 18.37 |
| Operating ratio (per cent).. | 77.7 | 77.3 | 0.4 | 0.51 |
| Ratio: Net income to operating revenue.......... | 10.42 | 9.05 | 1.37 | 15.13 |

## TABLE XIV—OPERATING EXPENSES (BY PRIMARY ACCOUNTS) OF 57 COMPANIES OPERATING COMBINED CITY AND INTERURBAN LINES,

| | 1923 | 1922 | Increase or (D) Decrease | Per Cent Increase or (D) Decrease |
|---|---|---|---|---|
| Way and structures....... | $12,964,995 | $12,457,176 | $507,819 | 4.18 |
| Equipment.............. | 9,251,825 | 8,830,803 | 421,022 | 4.77 |
| Power.................. | 12,058,863 | 11,796,747 | 262,116 | 2.22 |
| Conducting transportation. | 29,555,684 | 28,597,168 | 958,516 | 3.35 |
| Traffic.................. | 386,466 | 315,328 | 71,138 | 2.25 |
| General and miscellaneous. | 10,581,524 | 10,321,688 | 259,836 | 2.52 |
| Transportation for investment—Credit......... | 39,919 | 34,494 | 5,425 | 15.75 |
| Total operating exp. | *a*$75,053,926 | *b*$72,560,302 | $2,493,624 | 3.44 |

*a* Includes $294,508 undistributed expense. *b* Includes $275,886 undistributed expense.

## TABLE XV—OPERATING STATISTICS OF 57 COMPANIES OPERATING COMBINED CITY AND INTERURBAN LINES

| | 1923 | 1922 | Increase or (D) Decrease | Per Cent Increase or (D) Decrease |
|---|---|---|---|---|
| Passenger car-miles....... | 198,867,893 | 192,971,086 | 5,896,807 | 3.03 |
| Total revenue car-miles.... | 219,442,756 | 213,412,540 | 6,030,216 | 2.85 |
| Revenue passengers[1]...... | 1,041,476,932 | 1,004,374,329 | 37,102,603 | 3.69 |
| Transfer passengers[2]...... | 187,176,067 | 180,025,217 | 7,150,850 | 3.97 |
| Total passengers[1]......... | 1,240,766,283 | 1,197,891,370 | 42,874,913 | 3.58 |
| Passenger revenue........ | $89,450,613 | $87,778,978 | $1,671,635 | 1.90 |
| Revenue car-hours[3]....... | 22,561,417 | 21,885,271 | 676,146 | 3.09 |
| Miles of single track....... | 6,346.6 | 6,369.8 | (D) 23.2 | (D) 0.36 |
| Cars operated[4] *a*......... | 5,612 | 5,514 | 98 | 1.78 |

*a* Average maximum number of cars in service daily. [1] Reported by 56 companies. [2] Reported by 55 companies. [3] Reported by 52 companies. [4] Reported by 53 companies.

gers, increased 3 per cent. In actual numbers these increases mean that there were 255,246,412 more passengers carried by these 288 companies in 1923 than there were in 1922. The average maximum number of cars in daily service was 29,136 in 1923, compared with 28,160 in 1922, an increase of 3.46 per cent.

With these additional cars the companies operated 33,540,969 additional car-miles and 4,480,325 additional car-hours, this increase in service being somewhat greater than the increase in traffic.

As has already been said, fares were lower in 1923 than in 1922. In the table of derived ratios, the average fare per revenue passenger is shown. It was 7.2 cents in 1922 and 7.1 cents in 1923, a decline of nearly one and one-half per cent.

On account of this decrease in the rate of fares, the revenues of the companies did not increase in proportion to the increase in the volume of traffic nor in proportion to the increased service given.

The operating revenues did increase, however, some 2 per cent. The actual increase in revenue amounted to $11,069,082, being $549,825,275 in 1923 as against $538,756,193 in 1922.

Expenses, on the other hand, increased slightly more than the increased traffic and increased service would account for. This was due principally to the increased wages paid in 1923 and, in a lesser degree, perhaps to increase the cost of materials.

In summing up Mr. Murphy says three factors influenced operations: (1) An increase in the cost of providing service; (2) an actual increase in the amount of service produced, and (3) a lower unit price for the service sold. The actual decline in net revenue was $3,656,948, or 2.59 per cent. The operating ratio rose from 73.8 per cent to 75.0 per cent.

Mr. Murphy says that viewing the industry as a whole the year was not without certain favorable features. True it is somewhat discouraging after enjoying the biggest year on record to find that net profits have been reduced. But sight should not be lost of the fact that it was the biggest year in volume of business on record, in spite of the inroads made by the private automobile and the organized bus lines. The traffic is there waiting for the traction lines to handle it. The real problem is how to handle it at a greater profit. In 1923 lower fares and higher expenses reduced the profit but already there is evidence that the force of these two conflicting movements has been spent. The rise in costs has tended to put a quietus on the demand for lower fares, and the slackening of business activity has tended to stop the rise of prices. Whether the traction companies can hold their traffic gains under such conditions remain to be seen in 1924.

As regards the companies operating city lines exclusively the results scored by them follow very closely the trend of the national group covering all types of companies. The operating ratio of the city companies is several points lower than the average of all companies. The city ratio rose from 72.1 per cent in 1922 to 73.5 per cent in 1923, a proportionately smaller increase than that of the general group. On the other hand the proportion of operating revenues remaining as net income after the payment of all charges is less in the case of the city group than in the case of the general group. This apparent inconsistency is explained by the fact that the city companies received only about one-third of the total revenues from auxiliary operations and non-operating income, whereas they pay about two-thirds of the total taxes and fixed charges.

The results of the operations of 117

TABLE XVI—INCOME STATEMENT OF 114 CITY COMPANIES, 117 INTERURBAN COMPANIES AND 57 COMPANIES OPERATING COMBINED CITY AND INTERURBAN LINES (ON A CAR-MILE BASIS).

| | City Lines | | | Interurban Lines | | | City and Interurban Lines | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1923 | 1922 | Per Cent Increase or (D) Decrease | 1923 | 1922 | Per Cent Increase or (D) Decrease | 1923 | 1922 | Per Cent Increase or (D) Decrease |
| Railway operating revenue | 45.0 | 45.5 | (D) 1.0 | 45.4 | 46.4 | (D) 2.0 | 43.9 | 43.9 | ........ |
| Railway operating expense | 33.0 | 32.9 | 0.2 | 35.6 | 35.4 | 0.6 | 34.2 | 34.0 | 0.6 |
| Net operating revenue | 12.0 | 12.6 | (D) 4.5 | 9.8 | 11.0 | (D) 8.9 | 9.8 | 10.0 | (D) 2.0 |
| Net revenue: Auxiliary operations | 1.0 | 1.0 | ........ | 3.1 | 2.5 | 22.4 | 4.3 | 3.9 | 10.3 |
| Taxes | 3.0 | 3.0 | ........ | 2.8 | 2.8 | ........ | 2.9 | 2.8 | 3.6 |
| Operating income | 10.0 | 10.6 | (D) 5.5 | 10.1 | 10.7 | (D) 5.50 | 11.3 | 11.2 | 0.9 |
| Non-operating income | 0.5 | 0.5 | ........ | 1.0 | 0.9 | 11.0 | 3.3 | 3.3 | 3.1 |
| Gross income | 10.5 | 11.1 | (D) 5.5 | 11.1 | 11.6 | (D) 4.0 | 14.6 | 14.3 | 2.1 |
| Deductions from gross income | 7.7 | 7.9 | (D) 2.8 | 8.0 | 8.3 | (D) 3.5 | 10.0 | 10.3 | (D) 2.9 |
| Net income | 2.8 | 3.2 | (D) 12.5 | 3.1 | 3.3 | (D) 6.00 | 4.6 | 4.0 | 15.0 |

TABLE XVII—OPERATING EXPENSES OF 114 CITY COMPANIES, 117 INTERURBAN COMPANIES AND 57 COMPANIES OPERATING COMBINED CITY AND INTERURBAN LINES (ON A CAR-MILE BASIS)

| | City Lines | | | Interurban Lines | | | City and Interurban Lines | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1923 | 1922 | Per Cent Increase | 1923 | 1922 | Per Cent Increase | 1923 | 1922 | Per Cent Increase |
| Way and structures | 4.6 | 4.5 | 2.22 | 6.2 | 6.2 | ........ | 5.9 | 5.7 | 1.76 |
| Equipment | 4.0 | 4.0 | .... | 4.3 | 4.1 | 4.65 | 4.2 | 4.1 | 2.44 |
| Power | 4.7 | 4.7 | .... | 6.1 | 6.3 | (D) 3.17 | 5.5 | 5.5 | ..... |
| Conducting transportation | 14.7 | 14.7 | .... | 12.7 | 12.3 | 3.25 | 13.5 | 13.4 | 7.48 |
| Traffic | 0.1 | 0.1 | .... | 0.4 | 0.4 | ........ | 0.2 | 0.1 | 100.0 |
| General and miscellaneous | 4.4 | 4.3 | 2.33 | 5.7 | 5.8 | (D) 1.72 | 4.8 | 4.8 | ..... |
| Transportation for investment—Credit | .... | .... | .... | .... | .... | ........ | .... | | ..... |
| Total operating expenses | a33.1 | b33.0 | 0.33 | 35.4 | 35.1 | 0.85 | 34.1 | 33.6 | 1.49 |

a Includes 0.6 cent undistributed expense. b Includes 0.7 cent undistributed expense.

interurban companies were not quite so good. As compared with city lines their traffic increased only about 2.5 per cent, compared to 3 per cent for the city lines. On the other hand the average rate of fare was slightly higher in 1923 than in 1922, with the result that their railway revenues increased 2.05 per cent compared with 1.84 per cent for the city lines. The operating ratio of the interurbans rose from 76.0 per cent to 78.5 per cent, while the ratio of net income to operating revenue dropped from 7.18 per cent to 6.60 per cent.

A third group of companies numbers 57 and consists of those operating combined city and interurban lines as part of one system. Mr. Murphy says it might fairly be expected that these companies would form a hybrid group, exhibiting certain of the characteristics of both of the other groups and forming a mean between them. In so far as the averages and ratios of this group are concerned this expectation is justified. It falls naturally midway between the other groups. But strangely enough it is the only group which increased its net income in 1923. The operating ratio of this group rose from 77.3 per cent in 1922 to 77.7 per cent in 1923. On the other hand the ratio of net income to operating revenue rose from 9.05 per cent in 1922 to 10.42 per cent in 1923.

Further analysis of the figures has been made by dividing each group into companies having annual revenues of more than $1,000,000, companies having revenues of $250,000 to $1,000,000 and companies having revenues of less than $250,000 a year. In Mr. Murphy's study these tables were numbered from XIX to XXVII. They have been omitted from the present summary.

The forty-seven city companies having revenues of more than $1,000,000 a year, have the lowest operating ratio. In 1923 the operating ratio increased from 72.1 per cent to 73.2 per cent, and there was a decrease of 9.06 per cent in the net income. In the case of the medium-sized companies having revenues of from $250,000 to $1,000,000, the operating ratio dropped from 76.3 per cent to 75.4 per cent and there was an increase of 24.03 per cent in the net income in 1923. The small companies having annual revenues of less than $250,000, on the other hand, suffered a loss of 53.6 per cent in net income and their operating ratio rose from 84.3 per cent to 86.5 per cent. In other words, the large city companies are in the strongest position as measured by their operating ratio, but lost some ground in 1923.

Among the interurbans the companies with revenues of more than $1,000,000 a year made the best showing. They increased their net income, but their operating ratio rose from 74.4 per cent to 76.6 per cent. The medium-sized companies suffered a loss of 44.7 per cent in net income while their operating ratio rose from 78.7 per cent to 81.2 per cent. The small interurbans are operating at a deficit, which increased from $125,888 in 1922 ot $293,927 in 1923. The operating ratio rose from 80.0 per cent to 84.0 per cent. In the interurban group, therefore, it is the largest companies that are making out best.

Among the companies operating combined city and interurban properties the large companies again are making the best showing. Their operating ratio rose slightly, from 75.6 per cent to 76.2 per cent, but in 1923 they increased their net income 12.64 per cent. The medium-sized companies, on the other hand, are operating at a deficit, which, however, was decreased from $570,319 to $105,627, a decrease of 81.48 per cent. Their operating ratio fell from 84.5 per cent to 83.6 per cent. The operating ratio of the small companies rose from 85.6 per cent in 1922 to 90.0 per cent in 1923. They operated at a deficit of $290,514 in 1922, and this was increased to $377,523 in 1923.

TABLE XVIII—SIGNIFICANT RATIOS DERIVED FROM THE STATEMENTS OF EARNINGS OF THE COMPANIES

| | 114 City Companies | | | 117 Interurban Companies | | | 57 Companies Operating Combined City and Interurban Lines | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1923 | 1922 | Per Cent Increase | 1923 | 1922 | Per Cent Increase | 1923 | 1922 | Per Cent Increase |
| Railway operating revenue | $364,781,419 | $358,173,520 | 1.84 | $88,476,229 | $86,694,517 | 2.05 | $96,567,627 | $93,888,156 | 2.85 |
| Per mile of single track | 34,111 | 33,623 | 1.45 | 10,817 | 10,588 | 2.16 | 15,215 | 14,739 | 3.22 |
| Passenger revenue | 355,465,052 | 349,445,992 | 1.72 | $69,094,473 | $67,266,869 | 2.71 | $89,450,613 | $87,778,987 | 1.90 |
| Per revenue passenger | [1]6.5c | [1]6.6c | (D) 1.52 | [4]11.7c | [4]11.6c | 0.86 | [7]7.6c | [7]7.7c | (D) 2.07 |
| Per total passenger | [1]5.1c | [1]5.2c | (D) 1.93 | [4]10.3c | [4]10.2c | 0.98 | [7]6.4c | [7]6.5c | (D) 1.54 |
| Per mile of single track | $33,240 | $32,804 | 1.32 | $8,447 | $8,216 | 2.81 | $14,094 | $13,780 | 2.27 |
| Per passenger car-mile | 44.0c | 44.6c | (D) 1.35 | 39.9c | 39.9c | ........ | 44.9c | 45.4c | (D) 1.11 |
| Per car operated | [2]$15,928 | [2]$16,249 | (D) 1.98 | [5]$16,401 | [5]$16,477 | (D) 0.47 | [8]$14,932 | [8]$14,922 | 0.06 |
| Per revenue car hour | [3]$4.02 | [3]$4.12 | (D) 2.43 | [6]3.97 | [6]4.00 | (D) 0.75 | [9]3.86 | [9]3.90 | (D) 1.03 |
| Revenue passengers | [1]5,411,344,990 | [1]5,232,073,596 | 3.42 | [12]569,918,785 | [12]561,179,897 | 1.55 | [7]1,041,476,932 | [7]1,004,374,329 | 3.69 |
| Per mile of single track | [1]511,615 | [1]496,877 | 2.96 | [12]71,381 | [12]70,248 | 1.61 | [7]183,606 | [7]176,789 | 3.85 |
| Per passenger car-mile | [1]6.7 | [1]6.7 | ........ | [12]3.3 | [12]3.4 | (D) 2.95 | [7]5.7 | [7]5.7 | ........ |
| Per car operated | [10]239,841 | [10]241,381 | (D) 0.64 | [13]157,037 | [13]161,359 | (D) 2.68 | [9]191,340 | [9]187,722 | 1.92 |
| Per revenue car hour | [11]61 | [11]62 | (D) 1.62 | [14]40 | [14]41 | (D) 2.44 | [15]50 | [15]50 | ........ |
| Total passengers | [1]6,830,404,389 | [1]6,626,922,391 | 3.07 | [12]647,986,569 | [12]639,097,068 | 1.39 | [7]1,240,766,283 | [7]1,197,891,370 | 3.57 |
| Per mile of single track | [1]645,780 | [1]629,343 | 2.61 | [12]81,159 | [12]80,002 | 1.44 | [7]218,740 | [7]210,851 | 3.74 |
| Per passenger car-mile | [1]8.5 | [1]8.5 | ........ | [12]3.8 | [12]3.8 | ........ | [7]6.9 | [7]6.9 | ........ |
| Ratio: | | | | | | | | | |
| Transfer passengers to revenue passengers (per cent) | 22.4% | 22.6% | (D) 0.89 | 12.8% | 12.7% | (D) 0.78 | 17.9% | 17.9% | ........ |
| Revenue car-miles | 811,955,756 | 787,192,929 | 3.14 | 194,616,639 | 187,882,163 | 3.58 | 219,442,756 | 213,412,540 | 2.82 |
| Per mile of single track | 75,928 | 73,897 | 2.74 | 23,794 | 22,948 | 3.68 | 34,576 | 33,503 | 3.20 |
| Per car operated | [2]36,063 | [2]36,337 | (D) 0.76 | [5]45,268 | [5]45,776 | (D) 1.11 | [8]36,797 | 36,446 | 0.96 |
| Per car hour | [3]8.9 | [3]9.0 | (D) 1.12 | [16]10.9 | [16]11.0 | (D) 0.91 | [9]9.4 | [9]9.4 | ........ |
| Car hours | [3]79,808,224 | [3]76,507,341 | 4.31 | [6]13,161,796 | [6]12,658,500 | 3.97 | [9]22,561,417 | [9]21,885,271 | 3.08 |
| Per car operated | [17]3,997 | [17]3,995 | 0.65 | [18]4,088 | [18]4,060 | .068 | [19]3,898 | [19]3,844 | 1.40 |

[1] 110 companies.
[2] 102 companies.
[3] 109 companies.
[4] 115 companies.
[5] 87 companies.
[6] 93 companies.
[7] 56 companies.
[8] 53 companies.
[9] 53 companies.
[10] 100 companies.
[11] 106 companies.
[12] 114 companies.
[13] 86 companies.
[14] 90 companies.
[15] 51 companies.
[16] 94 companies.
[17] 98 companies.
[18] 77 companies.
[19] 48 companies.

**Winnipeg Railway to Change Its Name.**—In commenting on the affairs of the Winnipeg Electric Railway, Winnipeg, Man., the Canadian *Financial Post* said recently that eventually the Winnipeg Electric Railway is likely to be a much greater power company than traction company and that evidence of this is to be found in the decision of the company to change its name to the Winnipeg Electric Company.

**Country Club Line Abandoned.**—The Pittsburg County Railway, McAlester, Okla., has been given permission by the Corporation Commission to abandon its line, extending from the southern boundary of McAlester to the Country Club.

**Net Loss $174,398.**—The San José Railroads, operating in San José, reports to the California Railroad Commission for the year 1923 that its operating revenue was $419,749 and operating expenses $345,374, giving a net operating revenue of $74,375. Interest, rent, taxes and other deductions totaled $250,983. The net corporate loss for the year was $174,398. The accumulated deficit at the end of the year was $1,304,147.

**Gold Bond Issue Authorized.**—The Indiana Public Service Commission has authorized the Gary Street Railway, Gary, Ind., to issue $643,000 of 5 per cent gold bonds and $140,000 of common stock to be sold at 75 per cent of par value. The money to be obtained from the sale of securities is to be used in making additions and betterments to the property.

**Eastern Massachusetts Dividends Declared.** — The Eastern Massachusetts Street Railway, Boston, has declared a dividend of five-sixth of 1 per cent on the adjustment stock, payable on May 15 to holders of record of April 30. This dividend covers the two months' period from Feb. 1 to April 1. Under the readjustment plan, which became effective on Jan. 4, 1922, the adjustment stock was non-cumulative until Feb. 1, 1924. During 1923 the adjustment stock received 5 per cent.

**$2,616,208 Surplus for Brooklyn Company for Nine Months.**—For the nine months ended March 31, the first nine months operation under the reorganization plan, the Brooklyn-Manhattan Transit Corporation, the successor to the Brooklyn Rapid Transit Company, reported a surplus of $2,616,208 after charges. This is the equivalent of $1.40 a share on the 766,530 shares of common stock after allowing for the sinking fund on the new rapid transit security 6s and dividends at the rate of $6 a year on the preferred stock, aggregating $1,451,478 for the nine months. The surplus is also equivalent to twice the dividend requirements after deducting charges for the sinking fund. The plan adopted last year provided that the annual sinking fund payments of 2-3 per cent on the $92,697,207 new 6 per cent bonds were to begin on Jan. 1, 1927, unless dividends were declared on either the preferred or common stocks prior to that date. An initial dividend of 1½ per cent having been declared on the preferred payable on May 1, sinking fund payments must begin not later than that date.

# Legal Notes

MASSACHUSETTS — *Operator of Street Car Not Required to Sound Warning and Slacken Speed on Approaching Intersection.*

While the duty rests on the operator of a street car at all times and in all places to manage his car with a high degree of care, he is not required by law to give warning signals or slacken speed of his car and keep it under control, provided when he nears an intersecting street he will not be proceeding at an unreasonable rate of speed. [Froio vs. Eastern Massachusetts St. Ry., 142 Northeast Rep., 255.]

MICHIGAN — *Equity May Change the Provisions of a Trust Mortgage, Even Though These Changes Bind Absent Beneficiaries of Mortgage.*

This case arose over the forced sale by the Detroit United Railway to the city of Detroit for $19,850,000 of the Detroit city lines, appraised at $43,000,000. The protection of the Chancery Court was invoked by representatives of holders of the $25,000,000 bond issue of the Detroit United Railway, covering the entire property. A provision of the trust mortgage said that the company might sell materials, supplies, rolling stock, etc., and all real estate, buildings and fixtures no longer useful or necessary to the business, but this was held not to cover the sale of the entire city system forming part of the security of the bonds issued. Such a condition, however, can be considered by equity, which has power not only to construe the instrument creating the trust, but change it to carry out the settlor's intention. It has power sometimes even to instruct the parties concerned to act in opposition to the provision, if necessary to preserve the trust property and protect the beneficiaries' right. Its judgments not only apply to all parties represented in the case but to parties not individually represented, as it is obviously impossible to gather and have present in court 1,200 street railway bondholders scattered throughout the world. [City of Detroit vs. Detroit United Railway et al., 197 N. W. Rep., 697.]

MISSOURI—*Authority for Operating Defective Car Was Sufficient.*

A motorman of two months' experience ran into the car ahead while on a slight grade and was injured. When he took the car out in the morning, he discovered the air brakes were not in good condition, but was told by the dispatcher that the car in question was the only one available and to take it at least as far as the next carhouse. At the time of the accident he tried to stop the car with the air and then by the hand brake, but applied the latter too late. The court held that his action was not negligent, and that while the company had a rule that when a car is not in order, the motorman must refuse to take it out of the carhouse, the authority of the dispatcher overrode this rule. The company, therefore, was held liable. [Lauderdale vs. Kansas City Railways, 250 S.W. Rep., 736.]

MONTANA—*Trial Court May Remit Excessive Verdict as Condition to Denying New Trial Without Infringing on Right to Jury Trial.*

Where the court is warranted in finding that the damages awarded are excessive, it may order the excess remitted as a condition to denying defendant's motion for a new trial without violating the right to trial by jury. The objection that the damages awarded are excessive may be raised because the evidence is conflicting or because it is insufficient to sustain the verdict. [Bull vs. Butte Electric Railway, 223 Pacific Rep. 514.]

NEW YORK—*Non-Availability of Less Dangerous Apparatus Is No Defense Where It is Not Essential to Operation.*

The plaintiff's finger was injured in the mechanism of a turnstile at the Fourteenth Street subway station. The defense claimed that there was no proof of negligence in the construction or maintenance of the turnstile machine, but the court held that non-availability of a less dangerous machine is no excuse for installing dangerous equipment not essential to the operation of the railroad. [Chakofsky vs. Interborough R. T. Co., 203 N. Y. Sup., 357.]

NEW YORK—*Injury to Employee After Day's Work Held Compensable.*

Where it was the duty of a trolley car conductor to report and turn in the day's receipts before 9 o'clock the next morning, and a conductor, instead of going directly to the office at the end of his run, went home to make out his report, and on his way to the office about an hour later fell and was injured, the accident rose "out of and in the course of his employment" within the meaning of those words in the workman's compensation law. [Wilber vs. Fonda J. & G. R.R., 203 New York Sup., 336.]

TEXAS—*Duty of Company to Warn Employees of Independent Contractor When They Are Working in a Dangerous Position.*

An independent contractor agreed with an electric railway and several steam roads to build a causeway and to indemnify them for all damages connected with the prosecution of this work. An employee of this contractor, received a shock when the boom of the derrick he was operating came in contact with an uninsulated feed wire of the electric railway company. The company was not guilty of negligence in maintaining the wires in the condition they were in, but was held to be negligent in not giving the employees of the contractor sufficient warning of the danger if the boom came in contact with these wires. [Galveston-Houston Electric Railway et al v. Reinle, 258 Southwest Rep., 803.]

# Personal Items

## Coffin Honored by Franklin Institute

Charles A. Coffin, former president of the General Electric Company, was awarded a certificate of honorary membership in the Franklin Institute on April 16 at Philadelphia. This honor, conferred by one of the foremost scientific societies in the world, was in recognition of Mr. Coffin's many achievements and contributions to the electrical industry. The presentation was made in the assembly hall of the Institute in Philadelphia. The membership certificate was presented by C. F. Eglin, president of the Institute. Mr. Coffin is the twenty-eighth person so honored by membership in the Institute.

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**E. W. Allen**, formerly engineer and assistant manager of the Central district of the General Electric Company, with headquarters in Chicago, has been appointed manager of the engineering department of that company, with offices at Schenectady. Mr. Allen was born in Buchanan, Va., on Nov. 8, 1880. He was graduated from the Virginia Polytechnic Institute in 1900 with a B. S. degree in electrical engineering. He entered the employ of the General Electric Company in January, 1901, in the test department in Schenectady. On Dec. 1, 1902, he was assigned to the lighting engineering department, where he remained until Sept. 30, 1911, when he was appointed engineer of the Chicago district. On Sept. 1, 1913, he was made assistant district manager in addition to his duties as district engineer. Early in 1917 he entered the military service and served two years. He returned to the company in April, 1919. A. F. Riggs has been named district engineer to succeed Mr. Allen.

**Herbert J. Flagg** has resigned as chief engineer of the State Department of Public Works at Olympia, Wash., effective May 1, to become connected with the Grays Harbor Railway & Light Company, Aberdeen, which is controlled by the Federal Light & Traction Company.

**C. C. Levis**, manager of the Eastern offices of H. M. Byllesby & Company, has been elected a vice-president of the company. With the exception of two years when he served in the United States Army, he has been connected with the above organization since 1914. It was in January, 1922, that he was placed in charge of all the Eastern offices. Prior to that he had been appointed manager of the New York office. He has been identified with the electrical industry for practically seventeen years, first becoming associated with the General Electric Company and its allied interests in England. In this connection he served seven years, taking a two-year course in the works of the British Thomson-Houston Company, Ltd., and later handled the business of that company in the Far East.

**E. E. Howard** has recently become head of the investment department of the Interstate Public Service Company, Indianapolis, Ind. With a bond selling experience of thirty years he is well qualified to handle the banking and sales campaigns of the company.

**W. E. Wood**, manager of the Houston Electric Company and the Galveston-Houston Electric Railway, since May, 1920, has been elected chairman of the railway section of the Southwestern Public Service Association. He was formerly general manager of the Galveston Electric Company. All of these properties are under Stone & Webster direction. Mr. Wood has been connected with the Stone & Webster organization since his graduation from the Georgia Institute of Technology in 1907. He spent the year following his graduation in the home office of Stone & Webster, in Boston, Mass., and was then transferred to the Jacksonville Traction Company, where he worked in several departments as a student. In 1912 he was made superintendent of the Jacksonville system, continuing to serve in that capacity until 1916, when he was transferred to Houston as general superintendent of the system there. He was subsequently appointed manager of the El Paso Electric Company and still later manager of the Galveston Electric Company.

**William M. Black**, since 1919 chief engineer of the Maine Public Utilities Commission, has resigned to become electrical engineer of the Pennsylvania Public Service Commission. He will take up his new duties about May 19. On the Maine commission he has been active in valuation, service and safety engineering. Following his graduation in 1909 in civil engineering at the University of Maine, he became cost clerk for Frank B. Gilbreth, efficiency engineer, and later engaged in structural work with the Hudson Structural Steel Company, Hinckle Iron Works, Milliken Brothers, American Bridge Company, Gunwald Aus and Post & McChord. He was employed at one time on subway construction in New York City as steel foreman, engineering foreman, assistant to resident engineer for Jacobs & Davies, and bridge engineer, 1918-1919.

**Sylvester D. Smith**, superintendent of the elevated lines of the Interborough Rapid Transit Company, New York, was tendered a surprise dinner recently to celebrate his golden anniversary with the company. Fifty years ago Mr. Smith went to work as a conductor on the Ninth avenue "L," the first of New York's lines above the ground, and then known as the New York & Yonkers Patented Elevated Railway. Thirty-three years ago he was made superintendent, and 319 men, representing every branch of the service, greeted him in the Schnorer Club of the Bronx. Old engineers of the elevated came from all parts of New York to sup with the superintendent, and officers of the road came from the executive offices at 165 Broadway, the construction and motive power departments. Frank Hedley, president of the company, presided at the banquet and crowned his superintendent with a golden fez and dubbed him "King of the Interborough." From the men under him, Mr. Smith received a round robin in which his name, Sylvester D., was transposed to "Square Deal" Smith.

**John B. Tinnon**, identified with the Chicago & Joliet Electric Railway, Joliet, Ill., for approximately twelve years resigned his position as engineer maintenance of way on May 1 to become connected with the Metal & Thermit Corporation of New York in charge of its rail welding department. It was in April, 1908, that Mr. Tinnon entered the employ of the Chicago City Railway as instrument man under W. F. Graves, engineer of construction. Later he was given charge of track welding and various other duties, and in the early part of the year 1910 was made assistant engineer. In this capacity he had charge of the installation of the special work in the downtown district and from 1910 to September, 1912, he had charge of about half of the track construction and maintenance on the City Railway lines under Mr. Graves. Then it was that he went to Joliet as engineer maintenance of way, and was there until May 1 of this year except between August, 1918, and February, 1919, when he was in the Ordnance Department, U. S. A. For the past six years he has really been serving in the capacity of chief engineer. Mr. Tinnon was educated at the Vanderbilt University in Nashville, Tenn. His early connections included service with the Louisville & Nashville Railroad, B. F. Sturtevant & Company, Chicago, and Roberts & Schaefer Company, Chicago.

# Obituary

## H. M. Byllesby

The utility field suffered the loss of one of its outstanding figures in the death on May 1 of H. M. Byllesby, president of the Byllesby Engineering & Management Corporation, Chicago, pioneer engineer and promoter of electrical, gas and railway utilities. Colonel Byllesby began his professional career in the employ of the Corliss Engineer Works of Robert Wetherill & Company, Chester, Pa., and the Edison Electric Light Company. From 1885 through 1890 Mr. Byllesby was first vice-president and general manager of the Westinghouse Electric & Manufacturing Company, Pittsburgh, and also managing director of the Westinghouse Electric Company of London. At one time he was vice-president of the Washington Light & Traction Company, Washington, D. C. In 1902 he organized in Chicago the firm of H. M. Byllesby & Company, engineers, to operate and manage public utility undertakings. At the time of his death he was an officer and director of many utility companies, among them the Fort Smith Light & Traction Company, Ottumwa Railway & Light Company and the Wisconsin-Minnesota

Light & Power Company. During the war Mr. Byllesby served as purchasing agent for Great Britain and Scandinavian countries with the American Expeditionary Forces, with headquarters in London. In this activity the English Distinguished Service Order was conferred upon him. Mr. Byllesby was born in Pittsburgh. He was educated in the schools there and at the Lehigh University.

**John High**, sales manager of the railroad and mill board departments of the Pantasote Company, died on April 24 in Chicago. He was on a business trip when he was stricken and was removed to the Durand Hospital, where he died two days after entering that institution. Jack High, as he was known to railroad men all over the country, entered the service of the Pantasote Company at the time of its formation in 1897 and organized the railroad department of that company. In 1910 the railroad and mill board departments were combined and he was made sales manager. Before becoming connected with the Pantasote Company Mr. High was engaged in railroad work on the Pacific Coast. He was born in Chicago fifty-five years ago. He is survived by his wife and a son, John, Jr. Mr. High lived at Riverdale-on-Hudson.

**Colin Alexander Morrison**, superintendent of division five of the Los Angeles Railway died on April 18, following an illness of several weeks. He was 62 years old. Mr. Morrison was born at Mount Elgin, Ontario, Canada. In 1886 he began driving a horse car in Minneapolis. A few years later he moved west and in 1892 went to work on the cars in Portland, Ore. For three years he served as motorman and conductor and then went to California for his health. From 1895 to 1902 he worked for the San Francisco & San Mateo Railway Company. On June 1, 1902, he started as mechanical inspector for the Los Angeles Traction Company, which centered at the old division four property recently torn down. In 1910 the Los Angeles Railway absorbed this property.

## Interurban at Grand Rapids Delivers Coal

The Michigan Railroad has completed at Grand Rapids, Mich., a 2,500-ft. siding from its main line to the coal pocket of the Consumers Power Company and is delivering coal at the rate of 1,500 cars a year. The railroad expects eventually to haul twice that amount of coal. The Consumers Power Company is the latest of five firms now supplied direct by interurban freight. The railroad also recently made connections with the New York Central Railroad and, using its feeders to the Père Marquette Railroad, which have existed for some time, the interurban can transport and receive freight to or from any railroad coming into Grand Rapids. Additions have been made to the team and warehouse tracks in the past few weeks. Two additional team tracks and two house tracks have been installed, providing berthing space for forty-eight cars.

# Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

## $500,000 for Improvements in Knoxville

The Knoxville Power & Light Company, Knoxville, Tenn., has planned an expenditure of $500,000 for improvements during 1924. In addition to its power and light improvements, $285,000 will be spent on other betterments for the purpose of giving additional service. Out of this sum $125,000 will be spent at the car shops for extensions and improvements in building, $160,000 for rebuilding tracks, overhead and putting in additional sidings on street car lines.

In addition to the fourteen new cars which were purchased last fall, twenty-eight of the present cars are being remodeled and equipped as duplicates of the new cars at a cost of about $60,000. All of these cars will have the safety appliances that are now on the new equipment.

## $8,000,000 to Be Spent in Twin Cities in Five Years

The Twin Cities Rapid Transit Company, Minneapolis, Minn., has a five-year program to spend $8,000,000, of which $5,000,000 is to be spent in extensions and other permanent improvements and $3,000,000 for new type "noiseless" trolley cars, completion of the remodeling of the standard trolley cars into front exit type, and construction of one-man cars for use in Stillwater, Minn., a suburban extension of the Stillwater interurban from St. Paul. Fifty of these "noiseless" cars are to be built in a year and the front exits are being installed on the rear door cars at the rate of seventy-five a year. The Stillwater new cars are to be in operation by fall.

## $250,000 Improvements in East Liverpool

The Steubenville, East Liverpool & Beaver Valley Traction Company, East Liverpool, Ohio, through General Manager Smith, recently announced a program of development and increased power and roadbed facilities on the Beaver-Steubenville division, involving an expenditure of $250,000, during this spring and coming summer. New substations costing approximately $175,000 make up the largest item in the program.

In co-operation with the City Council of Toronto and the State Highway Department, the company plans laying a new double track on North Fourth street in the down-river town and pave according to state requirements. This work, which will start about May 1, is part of the improvement of the Ohio River highway from Toronto to Empire. The company cost is put at $35,000.

## ELECTRIC RAILWAY MATERIAL PRICES—MAY 1, 1924

### Metals—New York

| | |
|---|---|
| Copper, electrolytic, cents per lb. | 13.30 |
| Lead, cents per lb. | 7.95 |
| Nickel, cents per lb. | 26.00 |
| Zinc, cents per lb. | 6.25 |
| Tin, Straits, cents per lb | 47 875 |
| Aluminum, 98 to 99 per cent, cents per lb. | 27.50 |
| Babbitt metal, warehouse, cents per lb.: | |
| Fair grade | 60.00 |
| Commercial | 28.00 |

### Bituminous Coal

| | |
|---|---|
| Smokeless mine run, f.o.b. vessel, Hampton Roads | $4.45 |
| Somerset mine run, Boston | 2.25 |
| Pittsburgh mine run, Pittsburgh | 1.875 |
| Franklin, Ill., screenings, Chicago | 2 175 |
| Central, Ill., screenings, Chicago | 1.90 |
| Kansas screenings, Kansas City | 2.50 |

### Track Materials—Pittsburgh

| | |
|---|---|
| Standard Bessemer steel rails, gross ton | $43.00 |
| Standard open hearth rails, gross ton | 43.00 |
| Railroad spikes, drive, Pittsburgh base, cents per lb. | 2.95 |
| Tie plates (flat type), cents per lb. | 2.55 |
| Angle bars, cents per lb. | 2.75 |
| Rail bolts and nuts, Pittsburgh base, cents, lb. | 4.125 |
| Steel bars, cents per lb. | 2.25 |
| Ties, white oak, Chicago, 6 in.x8 in.x8½ ft. | $1.70 |

### Hardware—Pittsburgh

| | |
|---|---|
| Wire nails, base per keg | 3.00 |
| Sheet iron (28 gage), cents per lb. | 3.60 |
| Sheet iron, galvanized (28 gage), cents per lb. | 4 85 |
| Galvanized barbed wire, cents per lb. | 3.80 |
| Galvanized wire, ordinary, cents per lb. | 2.75 |

### Waste—New York

| | |
|---|---|
| Waste, wool, cents per lb. | 15 |
| Waste, cotton (100 lb. bale), cents per lb.: | |
| White | 12–18 |
| Colored | 9–14 |

### Paints, Putty and Glass—New York

| | |
|---|---|
| Linseed oil (5 bbl. lots), per gal. | $0.93 |
| White lead (100 lb. keg), cents per lb. | 12.25 |
| Turpentine (bbl. lots), per gal. | $0.91 |
| Car window glass, (single strength), first three brackets, A quality, discount* | 84.0% |
| Car window glass, (single strength), first three brackets, B quality, discount* | 86.0% |
| Car window glass, (double strength) all sizes, A quality, discount* | 85.0% |
| Putty, 100 lb. tins, cents per lb. | 4–6 |

*These prices are f.o.b. works, boxing charges extra.

### Wire—New York

| | |
|---|---|
| Copper wire base, cents per lb. | 15.625 |
| Rubber-covered wire, No. 14, per 1,000 ft. | $6 50 |
| Weatherproof wire base, cents per lb. | 17.50 |

### Paving Materials

| | |
|---|---|
| Paving stone, granite, 4x8x4, f.o.b. | |
| Chicago, dressed, per sq.yd. | $3 60 |
| Common, per sq.yd. | 2.95 |
| Wood block paving 3½, 16 treatment, N. Y., per sq.yd. | 2.56 |
| Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots | 53–54 |
| Crushed stone, ¾-in., carload lots, N. Y., per cu.yd. | 1.85 |
| Cement, Chicago consumers' net prices, without bags | 2.20 |
| Gravel, ¾-in., cu.yd., f. o. b. N. Y. | 1.75 |
| Sand, cu.yd., N. Y. | 1.25 |

### Old Metals—New York and Chicago

| | |
|---|---|
| Heavy copper, cents per lb. | 10.50 |
| Light copper, cents per lb. | 9.25 |
| Heavy brass, cents per lb. | 6.50 |
| Zinc, old scrap, cents per lb. | 4.00 |
| Yellow brass, cents per lb. (heavy) | 6.25 |
| Lead, cents per lb (heavy) | 6.50 |
| Steel car axles, Chicago, net ton | $16.25 |
| Cast iron car wheels, Chicago, gross ton | 16.25 |
| Rails (short), Chicago, gross ton | 17.25 |
| Rails, (relaying), Chicago, gross ton | 26.50 |
| Machine turnings, Chicago, gross ton | 7.25 |

In Steubenville the company will spend $10,000, in cooperation with the city and the Wheeling Traction Company, in the new "loop" plan of routing.

## American Car Buys Pacific Stock

The American Car & Foundry Company, Pittsburgh, has acquired a substantial stock interest in the Pacific Car & Foundry Company. The acquisition of this interest, it was pointed out, will give the American company a valuable connection on the Pacific coast.

## *Rolling Stock*

**Wisconsin Valley Electric Company, Wausau, Wis.,** recently purchased four cars from the American Car Company of St. Louis. The specifications of these cars follows:

| | |
|---|---|
| Type of car | Light-weight, double-truck, one-man city and suburban |
| Total weight | 32,000 lb. |
| Bolster centers, approximate | 23 ft. |
| Length over all | 43 ft. 6 in. |
| Truck wheel base | 5 ft. 1 in. |
| Width over all | 8 ft. 2 in. |
| Height, rail to trolley base | 10 ft. 6 in. |
| Body | Semi-steel |
| Finish | Enamel |
| Interior trim | Oak |
| Headlining | Agasote |
| Roof | Arch |
| Air brakes | G. E. straight air with Sutherland safety device |
| Signal buzzer | Consolidated |
| Car trimming | Bronze, statuary finish |
| Control | K-35 |
| Curtain material | Pantasote |
| Destination signs | Hunter |
| Wheel guards | H. B. or root |
| Hand brake | Brill |
| Heat equipment | Consolidated, truss plank |
| Headlight | O. B. Type SDT Gold Ray reflector |
| Motors | Four Westinghouse 510 |
| Registers | Ohmer |
| Sanders | O. B. |
| Seats | Rattan, full spring, upholstered |
| Step treads | Feralum |
| Thermostat | Consolidated |
| Trolley catcher | O. B. |
| Trolley base | O. B., Form 1 |
| Trolley wheels | More Jones V. K. |
| Trucks | Brill 77-E-1 |
| Ventilators | Brill |
| Wheels | Cast, 26-in. |

**Wisconsin Railway, Light & Power Company, Milwaukee, Wis.,** will spend approximately $160,000 for the purchase of new equipment.

**Pacific Electric Railway, Los Angeles, Cal.,** has placed an order with the Fageol Motors Company for twenty double-deck buses at a value of $12,250 each. The order is for immediate delivery.

## *Track and Line*

**Jamestown, Westfield & Northwestern Railway, Jamestown, N. Y.,** has announced through William H. Pickard, traffic manager, that it will begin at once the erection of a new scenic railway, to cost $50,000, at its Midway Park Chautauqua Lake.

**New York, N. Y.**—The New York Transit Commission recently made the award for the construction of the first section of the new Brooklyn crosstown subway to the Oakdale Contracting Company, whose bid of $3,948,830 was the lowest received. The new subway will link Brooklyn and Queens without the present necessity of passing under the East River and through Manhattan Borough.

**Key Route Transit Company, Oakland, Cal.,** plans the extension of its line 1,000 ft., to the entrance of Lakeshore Manor. This will mean that the residents of this section will have the advantages of rapid transit into Oakland and San Francisco.

**Duluth Street Railway, Duluth, Minn.,** proposes to spend $450,000 during 1924 to improve its service. For extensions into new territories, $85,000 will be spent, $302,000 for track and power plant improvements and $63,000 for the purchase of railway equipment.

**Public Service Railway, Newark, N. J.,** will lay a new asphalt pavement on Liberty Street, Trenton, N. J., for a distance of nearly a mile. The pavement will cost about $80,000. The company will also remove one of the rails on that thoroughfare, using one in the center of the street for the cars on the Newark-Elizabeth division.

**Puget Sound Power & Light Company, Bellingham, Wash.,** will shortly begin improvements on South Elk Street, at a cost of $50,000. Work includes laying of 150 tons of 93-lb. steel rails and paving between the rails. The company has also started work on a proposed new steel bridge to span Chuckanut Creek at Hibridge.

**Wisconsin Railway, Light & Power Company, La Crosse, Wis.,** is completing the installation of new steel rails and wire from Jackson Street south on Sixteenth Street to Farnam Street. Following the completion of this work an extension will be made from Eleventh and Market Street south on Eleventh to Farnam Street.

**United Railways, St. Louis, Mo.,** has been urged to extend the Lee Avenue division westward from Lee and Taylor Avenues to Lucas and Hunt Road in St. Louis County. The proposed extension would be 3 miles.

**Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.,** proposes to expend a total of approximately $4,000,000 in 1924 divided as follows: $2,200,000 for extensions, $1,035,000 for improvements and $700,000 for new equipment. It also has under way plans to build an extension in Chicago from Howard Street to Niles Center.

**Lake Superior District Power Company, Ashland, Wis.,** has plans under way for the expenditure of $1,065,000 to improve its electric light and power city and transmission systems, interurban and railway systems. The expenditure will be divided up into $50,000 for extensions, $315,000 for improvements and $700,000 for new rolling stock, power plant, gas plant and other equipment.

## *Trade Notes*

**G. A. Richardson,** manager of the technical publicity department of the Bethlehem Steel Company, Bethlehem, Pa., gave a talk recently before the Philadelphia section of the American Society of Mechanical Engineers on the new Bethlehem two-cycle Diesel type oil engine.

**Wilson Welder & Metals Company, New York, N. Y.,** has announced the increased demand for welding machines and welding wire had necessitated increasing the manufacturing facilities. The company will move its plant and general offices on May 1 to the Wilson Building, Hoboken Factory Terminal, Hoboken, N. J.

**L. A. Marshall,** for a number of years service manager of the Industrial Works, Bay City, Mich., is now connected with its Chicago office, 1051 McCormick Building, as sales engineer.

**Perey Manufacturing Company, Inc., New York, N. Y.,** manufacturers of turnstiles, has moved its offices from 30 Church Street to 101 Park Avenue.

**Kuhlman Electric Company, Bay City, Mich.,** manufacturer of power, power distribution and street lighting transformers, has opened a sales office at 300 Madison Avenue, in charge of D. F. Potter, Jr., New York manager. After completing the General Electric test course at the Lynn, Pittsfield and Schenectady plants, Mr. Potter entered the employ of the Robertson-Cataract Electric Company of Buffalo as sales manager. A year ago he became sales engineer for the Kuhlman Electric Company in Buffalo.

## *New Advertising Literature*

**Allen-Bradley Company, Milwaukee, Wis.,** has issued four bulletins on alternating current motor starters. One describes the automatic resistance starter, another the semi-automatic resistance starter, a third is called across-the-line starting switch and a fourth resistance starters.

**Electric Power Equipment Corporation, Philadelphia, Pa.,** has issued Bulletin 601 on Bennett Lightning Arresters. The pamphlet contains forty pages with illustrations and includes general information on the details of construction of these arresters, engineering data and instructions for installation.

**Rail Welding & Bonding Company, Cleveland, Ohio,** has issued bulletins Nos. 106 and 107. Bulletin 106 gives operating instructions on the preparation, welding and grinding of the Una rail joint and bulletin 107 decribes Una joint rod, grade 200.

**Heine Boiler Company, St. Louis, Mo.,** has issued a thirty-page booklet on the Heine cross-drum boilers. The bulletin, No. 53, describes the general design, details of construction, circulation and furnace arrangement of the cross-drum boilers. Information on cleaning boilers is also included.

**Philip Carey Company, Cincinnati, Ohio,** has issued a seventy-page pamphlet on elastite expansion joint. The book has some valuable information for engineers, architects, contractors and others engaged in the promotion, design and construction of pavements, roads and other forms of engineering construction.

**Metals Coating Company of America, Philadelphia, Pa.,** has issued a pamphlet describing the Metalayer, Schoop Process, of applying metals by means of a spray gun.

New York, May 10, 1924

# Electric Railway Journal

*Consolidation of Street Railway Journal and Electric Railway Review*

Published by McGraw-Hill Company, Inc.

HENRY W. BLAKE and HARRY L. BROWN, *Editors*

*Volume 63*
*Number 19*

## The National Chamber of Commerce and the Electric Railway

THE electric railways have always held that their business is so closely allied to the general prosperity of the community they serve that an injury to one is an injury to the other. Hence, if they can secure a sympathetic hearing from the business men of their community so that they can state their case fully and clearly, they are sure of a fair deal.

This position, which is undoubtedly correct, is the reason for the interest which the electric railway industry should take in the annual meeting of the Chamber of Commerce of the United States held at Cleveland this week. It also explains why the American Electric Railway Association was represented officially at that meeting by some fifteen delegates even though there was no question directly relating to electric railways on the program this year.

In the national chamber and in its constituent bodies, the local chambers of commerce and boards of trade, the business interests throughout the county have an agency of growing importance for constructive action, and it is a healthy sign that business men are taking this broader interest. It means more business and less politics in our national and state governments, more intelligence and less waste in our laws.

Probably no kind of industry in the community has more to gain from the entry of a larger number of business men into governmental affairs than the utility industry. The utilities have profited greatly, as has the public also, from commission rule. But the commissions need public support for their decisions, and this the business men in the community can give when they know the facts.

The electric railway industry benefited greatly from the study which the National Chamber of Commerce gave to the electric railway situation two years ago, as represented by its referendum No. 33. The vote on this occasion showed clearly that the business men in the country believe the electric railway is a prosperity builder, that the regulation of it should be promptly responsive to changing conditions, that it should not be subject to unfair competition, that it should be relieved of all burdens unrelated to service, and that the service should be given by a private company rather than a municipality.

The reports made by the committees on transportation of the national chamber last year were also of value to the electric railway industry, as they emphasized the importance of co-ordinating all means of transport and the need for simplifying the taxes of the steam and electric carriers. The fact that the general principles in both of these matters are but dimly understood by the public shows how much the national chamber has done and can do by further study along these lines.

The best way in which the individual railway man can help in this movement is by taking an active part in the work of his own chamber, helping its members to understand the railway's problems and encouraging them to support further study on these problems by the national chamber.

An outstanding address at the Cleveland meeting was that by Herbert Hoover in which he stated his belief that the vast tide of governmental regulation of commerce and industry can be stopped by the systematic and voluntary action of industry itself through the agency of trade associations.

## Pittsburgh's Way of Handling a Wage Proposal

A PROPERTY convalescing from a receivership is *prima facie* not strong enough to stand the shock of a sudden and large increase in operating expenses. This is the case with the Pittsburgh Railways, which is confronted by demands for increases in wages and amelioration in other conditions that would wipe out an estimated balance based upon a continuance of last year's good industrial conditions. It is interesting to note the manner in which the management is facing the situation.

Ordinarily a request for more wages is pitched to considerably higher figures than the men really expect to get, and the usual result is a compromise to some schedule that was really expected. In such negotiations the spirit of bargaining was as much to be looked for as in an Oriental bazaar. So it was a decided shock to the representatives of the men when the management frankly told them that while working conditions were subject to negotiation, any increase in the rate per hour was out of the question. No compromise could be offered.

When the leaders realized that the management said what it meant and meant what it said, they sought refuge in a strike vote. Nothing is easier. The men voted "Strike" whether they wanted one or not, in the apparent hope that the management would crumble before the fateful midnight hour of May 1. On the night of May 1, however, the leaders suddenly appreciated that they had started something not easy to finish. There was a hurry call for the intercession of Mayor Magee and a statement to the public that ample warning would be given should the men be ordered to quit.

This moral victory for the railway was obtained by going to the public through newspaper and mail publicity with more facts and figures than has usually been the case in wage discussions. The management made no threats whatsoever about replacing men who might go out. On the contrary, it gave the employees full credit for loyal service, but regretted that its income did not permit an increase in wages out of hand. The following plain facts plainly reiterated were too strong to be overcome:

First, all Pittsburgh knows that the railway has just come out of receivership and that receivers are not associated with prosperous concerns.

Second, almost every one appreciates that the fares are already beyond the elastic limit. The public is eagerly seeking a reduction in fares, as proved by the substantial increase in the sales of the liberalized (Sundays only) 10-cent crosstown transfer.

Third, the public now realizes that the average Pittsburgh platform man earns more per annum than the Pittsburgh laborer, semi-skilled workman, store clerk or office employee.

Fourth, President Thompson's discussions of post-receivership plans for improved service and equipment gave the public so good an idea of the company's intentions and resources that there is a strong feeling against anything that would delay these betterments.

Fifth, the publication of the company's budget for 1924 explained how little margin there was to meet payment of deferred debts and interest on new money.

Sixth, the daily advertisements and articles in the newspapers were supplemented by thousands of letters to business men to give them a more personal appreciation of their interest in the wage argument.

Seventh, the management's policy of acquainting scores of other electric railway men with the facts, through copies of its publicity, to the end that its willingness to give all the facts in its possession would be reciprocated by any counsel that seemed to fit the case, was helpful.

As this issue goes to press, it is impossible to say what the outcome of Mayor Magee's emergency investigation will be, but if newspaper accounts and letters to the company are satisfactory criteria, it is clear that the management's stand has won the public confidence to an unusual degree. Wages in Pittsburgh are not out of line and there is no occasion now for an increase.

## New York's Latest Transit Plan Involves Many Complications

A NEW transit plan for Greater New York, tentatively proposed by Daniel L. Turner and reviewed briefly elsewhere in this issue, is a suggestion primarily for relieving Grand Central and Pennsylvania stations in Manhattan and the Hudson River of the burden of handling commuter traffic, which now amounts to 20 per cent of all the steam railroad passenger traffic of the country. That something of the sort must be done soon is apparent, as the capacities of the two stations and the railroad ferries have practically been reached. As to the physical plan proposed in this instance there is much to be said. It might form a satisfactory solution of the situation, but no attempt is made at this time to show that it is the best solution. It is put out mostly to start discussion, its likelihood of execution as it stands being limited for three main reasons.

In the first place, three states and so many local communities (100 or more) are involved that it would be virtually impossible to bring about an agreement on a plan which tends to subordinate the wishes of the suburbanites to the needs of Manhattan Borough. Nor would these interests consent to the assessment upon them of a portion of the cost. Secondly, the railroads would not be reticent about declining to contribute to the cost of subway construction in the city—if they could be brought into agreement on the physical plan. Thirdly, the project is handicapped by the proposal to cut two new north and south vehicle arteries through Manhattan as a preliminary to subway construction.

## Common Sense May Be Better than Law in Settlement of Claims

HOW it was possible to reduce the amount of claims settlements against a street railway company to the almost incredibly low figure of one-tenth of 1 per cent of the gross revenue was told by W. T. Bie, one of the speakers at the recent Milwaukee meeting of the Wisconsin Public Utilities Association. The theme of the story, which is published in this issue, is that he made the claimants feel that the company was not merely a corporation, but a group of men of the same sort as those who had been injured. This is a worth-while accomplishment.

Far too often the claim department—or legal department, as it more correctly is called in the cases in mind—uses the time of many employees in preparing legal proof that the claimant is in the wrong, so that if the case is taken into court, an unbreakable chain of evidence can be built up that will exonerate the company. When this is the attitude, the legal department is likely to work in an impersonal, cold-blooded way.

Of course there are essential differences of method, depending on the size of the community and the character of the inhabitants. Green Bay, for instance, where the results mentioned were obtained, is small and the population is largely American born. In a very large city, with a mixed population, there may be more value in the legalistic method of handling claims. In fact, in a few cities of this class good results have been reported by establishing the reputation in the courts that the company will not submit to extortion.

But in general, especially in the smaller centers, the companies that have tried the legalistic method over a period of years have found that it begets distrust on the part of claimants. As a result the first reaction of the injured man is to hire the best lawyer he can afford in order to combat the known high-class talent of the company. Minor injuries and damages that might be settled out of court for a few dollars become the subject of expensive litigation, and the amount paid out by the company in the award is likely to be far greater than it might be otherwise, to say nothing of the lawyers' fees and court costs.

Why should the settlement of damage claims in the average city be put in the hands of lawyers, anyway? It is a straight man-to-man proposition to determine the facts and to compensate the claimant fairly in case the company is at fault. Or if the company is clearly not liable, the plain facts will tend to show that without need for a lawyer.

The field for the legal profession comes in case the claimant is unreasonable in his demands. Even then, Mr. Bie shows that on his road better results can be obtained with a jury by keeping the lawyer in the background and leaving the argument of the case to the motorman or some other representative of the company directly concerned in the accident than by having the legal talent of the company arrayed against the claimant's attorney.

# Issues in Massachusetts Wage Arbitration

### Springfield, Worcester and Associated Companies Present Significant Evidence that Many Cost-of-Living Theories Are Fallacious—Reduced Spread of Working Hours and Changes in Conditions Held to Be Camouflaged Methods of Securing Higher Wages for Platform Men

FUNDAMENTAL wage issues are involved in the pending arbitration of the Worcester Consolidated Street Railway, the Springfield Street Railway, and allied lines under the same management* in the Milford-Attleboro district of Massachusetts. These issues have been raised by the employees' requests relative to hours of labor, compensation and working conditions, as presented to a board composed of Lewis C. Parker, Westfield, chairman; James H. Vahey, Boston, for local divisions of the Amalgamated Association, and Bentley W. Warren, Boston, counsel for the railways. The number of employees concerned is 2,217; a long series of hearings at which 233 exhibits were presented has been concluded, and a finding is expected in the near future.

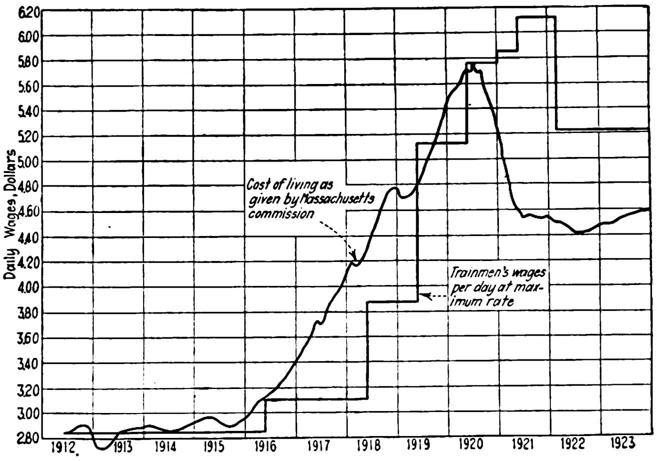
Acute interest in the proceedings has been manifested in traction circles on account of the demand of the union that the 11-hour spread specified by State law be rigorously adhered to and that the basic day for blue uniform men be made 8 hours instead of the 9 permitted by statute. The men also demanded a 5-minute allowance for turning one-man cars at the ends of lines, provision of change carriers on one-man cars, increased allowances for evening express car service, extra assistance in handling United States mail bags, and the classification of freight handlers on platforms as messengers. They also asked that all car movements in shops and yards be made by the transportation forces. In all there were between 20 and 30 such items. Most of these demands, when analyzed, prove to be unreasonable, and are mere pretexts for more pay. They have not, therefore, been considered in the present article.

## MASSACHUSETTS "9 IN 11" LAW UNIQUE

Involved in the question of the number of hours which blue uniform men shall work ordinarily, whether approximately 8 hours with an excess not exceeding 30 minutes in the case of 30 per cent of the scheduled runs, or 9 hours strictly limited and without any such excess, is the matter of spread or outside limit of such a day's work. Even more important than the number of hours of work to be fixed by the board is the number of hours to be included in this spread. The Massachusetts law (Chapter 833, Acts of 1913) is unique in that it fixes nine hours of work in a total of eleven as the maximum that may be demanded by operating street railway companies, although it authorizes longer hours and increased spread if the men consent. The spread permitted on every Massachusetts electric road, except possibly the Boston & Worcester interurban, is 14 hours or more.

If the employees' request for 8 hours is refused by the board the men state that they desire the enforcement of the 9-in-11 hours statute. The companies maintain that limitation of the spread to 11 hours, particularly for extra men, should call for an hourly rate of pay substantially less than might otherwise seem reasonable to the arbitrators, and substantially less than that prevailing on other properties where a greater spread of hours is permitted.

At present the allied companies in the controversy guarantee every spare man a minimum of 7 hours pay. This is tied up with a 9-hour day and a 12-hour spread within which the 7 hours work may be laid out or required. Under the present agreement, by paying a certain bonus, the extra man may be called upon to serve the company in the thirteenth, fourteenth or even further number of hours. The employees have requested that this guaranteed minimum for spare men shall be made 8 hours, with an 11-hour spread. The companies declare that they would hardly have agreed to so large a guaranteed minimum as 7 hours if the spread were to be limited to 12.



**Daily Wages of Springfield Trolleymen Compared with Cost of Living as Determined by Massachusetts Commission, 1912-1924 (1914 Taken as Base)**

## WAGE INCREASES FORCED UP FARES

From the summer of 1914 to the end of 1921, the rate of wages paid by all the companies involved in this arbitration had been increased about 140 per cent, from 28½ cents per hour to 68 cents per hour for blue uniform men, or, in Springfield, from $2.85 per day to $6.12 per day. The maximum increase in fare in Worcester and Springfield was of the order of 100 per cent. The rise in wages began in 1915, the first fare increases in Springfield and Worcester being deferred until 1918. As a consequence, all the companies fell seriously behind in revenue. The Worcester company, which for 25 years prior to the war had paid at least 5 per cent annual dividends, did not pay a single dollar in dividends during 1918-1921 upon its approximately $7,000,000 of capital stock, fully paid in under the drastic anti-stock-watering laws of Massachusetts. The Springfield company, which had paid at least 6 per cent annually during the same pre-war period, paid between 1917 and 1921 an aggregate of only 5 per cent upon its $4,654,700 paid-in capital stock. Measured by the lowest rates

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*Milford, Attleboro & Woonsocket Street Railway, Interstate Consolidated Street Railway and Attleboro Branch Railroad.

TABLE I—BUDGET FOR AVERAGE FAMILY

(Two adults and 1.4 dependent children)

Made up from minimum budget details prepared by Visiting Housekeepers' Association of Detroit, Sept. 1, 1923.

| *Food* | Per Month | Per Month |
|---|---|---|
| Man | $14.70 | |
| Woman | 11.40 | |
| Boy 11-14 | 11.40 | |
| 4/10 Girl 9-11 | 3.36 | |
| Add 10 per cent to man | 1.47 | $42.33 |
| *Light* | | 3.69 |
| *Fuel* | | |
| Cooking | 2.63 | |
| Heating | 8.13 | 10.76 |
| *Clothing* | | |
| Man | 9.33 | |
| Woman | 7.18 | |
| Boy 12-14 | 6.02 | |
| 4/10 Girl 10-12 | 2.64 | |
| Deduct 7 per cent | 1.76 | 23.41 |
| *Rent* | | |
| 5 rooms, unheated | | 45.00 |
| *Household Furnishings and Sundries* | | |
| Family of four | 8.10 | |
| Family of three | 7.17 | |
| Pro-rate for family of 3.4 | | 7.54 |
| *Extras* | | |
| Family of four | 6.34 | |
| Family of three | 5.67 | |
| Pro-rate for family of 3.4 | | 5.94 |
| Total per month | | $138.67 |
| Total per year | | $1,664.04 |

paid before the war the Worcester company was in arrears in dividends at the end of 1921 to the extent of $1,400,000 and the Springfield company, $1,163,675. The smaller companies failed to earn their fixed charges during much of the war period.

In February, 1922, an arbitration board headed by James J. Storrow of Boston, made a reduction of 10 cents or 14.7 per cent in blue uniform wages, establishing a rate of 58 cents per hour. The employees were then receiving 68 cents, an increase of 140 per cent over the pre-war rate. The cost of living had dropped from the peak at the time when the 68-cent rate had been agreed upon (203, based on the index figure of 100 for 1914) to 155 about March 1, 1922. The company had asked for an hourly rate of 50 cents. By voluntary agreement the 58-cent rate was continued for a second year, or until March 1, 1924.

During the two years 1922-1923 the Worcester company paid the current annual dividend upon its preferred stock of $5 per share and also paid two years of the four years accrued and unpaid dividends. On Jan. 1, 1924, it had paid nothing on its common stock for six years, and owed its stockholders a total of $1,647,360 in dividends. The Springfield company owed its stockholders in dividends $1,256,769 on this date.

### Length of the Working Day Arbitrated

The employees ignore the fact that only two years ago they submitted to arbitration the question of what constituted a reasonable and proper spread, and that the board in that case decided on 14 hours; or that practically every company in the state and its men have agreed upon a 14-hour spread. Not a representative of the employees was able to name a single electric railway in the United States, except the Boston & Worcester, which is attempting to conduct the street railway business under the limitations of an 11-hour spread.

The companies state that it is immaterial to them and to the public whether the workday base is 9 hours or 8, provided, first, that a reasonable latitude of say 30 minutes is allowed beyond the fixed number of hours to meet special requirements on particular lines, and second, that the hourly rate of pay remains the same whichever length of day may be fixed. To give 9 hours' pay for 8 hours' work would be an entirely different matter, and would cost the public at Worcester and Springfield $267,498 per year on a 58-cent basis, with no additional service rendered.

If the employees insist that the board shall be bound by the 11-hour statutory limitation, existing wages paid by other companies cease to be a *prima facie* standard for wage rates involved in this arbitration. Then it is necessary to determine the added cost to these companies in Massachusetts of the 11-hour spread. This is indicated in the following table, the figures for which were supplied by Prof. A. S. Richey of Worcester Polytechnic Institute, expert witness for the companies:

| Added costs per man-hour, cents | Springfield | Worcester |
|---|---|---|
| 9-in-11 hour day, with 7-hour guarantee | 4.656 | 5.721 |
| 8-in-11 hour day, with 8-hour guarantee | 7.018 | 9.644 |
| Rate equivalent to 58-cent rate without spread limited, cents per hour | | |
| 9-in-11 hour day, with 7-hour guarantee | 53.535 | 52.279 |
| 8-in-11 hour day, with 8-hour guarantee | 50.982 | 48.356 |

The companies maintained that if the spread is reduced to 11 hours, the 7-hour guarantee should also be substantially reduced. If an 8-hour day is required, for instance, the guarantee should be nearer 6 hours.

### How Should a Living Wage Be Determined?

Although it was criticised by some employees, the companies maintain that the standard of living which Mr. Storrow aimed at in the 1922 award was attained. This is indicated in the chart reproduced herewith, which is one of the many exhibits introduced in the case. The employees have now lived two years under the wage conditions fixed by him, the second of which was by virtue of a voluntary extension of the award. Many of them own and operate automobiles. Every employee appearing as a witness on the subject of living cost occupied a house or apartment with not less than five rooms and bath. Whether a bathroom is a necessity in these days depends on one's point of view, the companies maintain.

As to the actual earnings of the men, the following figures were submitted by the company:

AVERAGE ANNUAL AMOUNTS PAID BLUE UNIFORM MEN

| | Springfield | Worcester |
|---|---|---|
| All conductors | $1,784 | $1,856 |
| Spare conductors only | 1,729 | 1,871 |
| All motormen | 1,835 | 1,933 |
| Spare motormen only | 1,836 | 1,999 |

The average on the two roads is far in excess of the $1,750 which W. Jett Lauck, in the Federal Electric Railways Commission inquiry, declared "would be incapable of application at the present time owing to the fact that the board would not wish suddenly to inject a monkey wrench into the industrial wheels of the country."

In the Middlesex & Boston Street Railway arbitration in January, 1924, Chairman C. H. Donahue awarded the men 55 cents per hour after finding a $1,500 annual wage one which would limit the average employee too closely to the minimum standard of living. This rate is 3 cents below what the Springfield and Worcester men have been receiving under the Storrow award.

Most professional and employee budgets, the company maintains, are of little real aid in establishing a just wage rate. They all involve one inherent fallacy in an arbitrary assumption that any wage for a man should support himself, his wife and three dependent children under 14 years of age. This assumption is contrary to all known data. The United States census gives the average family in this country as a man, his wife and

1.4 such dependent children, and the wage should be fixed for such average family. A count taken at one of the hearings in this case of employees who happened to be present showed that the 35 married men averaged only 1.7 children. Including the 8 unmarried men brought the average number of children per man for the 43 in the count down to 1.37. Professor Richey showed that the present wages of blue uniform men at Springfield and Worcester were sufficient to meet, for an actual family of man, wife and 1.4 children, the requirements of each of the several budgets exhibited, except that of the Boston Elevated Railway, which was inflated by the living cost in a large city. The budget for Detroit conditions is included herewith as Table I.

Before 1921 the increased cost of living was a favorite and inevitable subject for testimony on behalf of employees. Since this cost began to fall it has occupied, in the company's words, "a position of much less honor among the employees in their preparation of arbitration cases." However, it continues the most important element in connection with changes in wage rates. Variations in the index figure follow, the dates taken being those in connection with the present wage case:

VARIATIONS IN COST OF LIVING INDEX, 1913-1924

| | |
|---|---|
| Average, 1913 | 100 |
| March 1, 1922 (Storrow award) | 155.3 |
| Jan. 1, 1923 (Storrow award extended voluntarily) | 157.1 |
| Feb. 1, 1924 | 159.7 |

Hence the most that these employees can claim logically is an increase of wages of 1.65 per cent, or slightly under 1 cent per hour compared with the beginning of 1923, or 1.6 cents above that fixed in the 1922 award. In both cases the company had the privilege of calling upon the spare men for work during a spread of 14 hours and longer if needed. The only difference was that under the 1923 arrangement they became entitled to their 7-hour guarantee after only 12 hours.

The company maintains that if this wage rate is giving them so much income that they insist on conditions affording them greater leisure and more idle time, it is evident that the men do not need and should not receive so high a wage rate for this diminished labor equivalent. Thus the men, by their insistence upon the statutory limitation, make it impossible for the board to consider the wage question from any standpoint of comparison used in the past between these parties or considered in other arbitrations.

### COMPARISON WITH WAGES PAID ON OTHER ROADS

Much testimony was introduced by the employees as to the wages actually paid various classes of public employees and as to the hoped-for increases in the wages of some of these, notably the letter carriers. There is one vital distinction which makes any comparison of pay useless as a guide for an arbitration board. The employees of the Boston Elevated Railway, for instance, are paid from public treasuries kept full by the taxpayers. The managements of privately owned street railways have no such recourse to the purses of the public, and the street railway patron can refuse to use the facilities furnished if fares are raised too much.

An exhibit in this case covering 314 electric railways of major importance in this country shows that only 35 companies paid over 58 cents per hour, the going rate in Worcester and Springfield. Of the remaining 279, five paid 58 cents and all the other 274 paid under 58 cents. So far as could be ascertained only 15 companies besides those involved in the proceedings paid a differential of over 5 cents per hour for one-man car operation. Of these 15, one paid 6 cents, one 6⅔ cents, seven paid 7 cents, one paid 7.3 cents, two paid 8 cents, one paid 8.6 cents and two paid 10 cents. Among 85 street railways, each operating over 100 miles of track, the average hourly rate, according to the American Electric Railway Association, was 54.93 cents. The weighted average wage of 16 companies operating in cities of over 200,000 and under 500,000 population is 54.75 cents per hour, and there is no limitation of the spread. Twenty-three companies, operating in cities between 100,000 and 200,000 population (about the size of Worcester and Springfield), have a weighted average wage of 52.8 cents per hour. In general the wage rate drops in proportion to the size of the city involved.

In six out of 13 arbitrations in the United States during 1923 the rate awarded was higher than 58 cents per hour. These cases were:

WAGES AWARDED IN SIX ARBITRATIONS

| | Population | Pate, Cents |
|---|---|---|
| Cleveland | 796,000 | 60 |
| Chicago Surface Lines | 3,000,000 | 73 |
| Chicago Elevated | 3,000,000 | 75 |
| Detroit | 1,000,000 | 70 |
| Boston | 750,000 | 70 |
| Scranton, Pa. | 137,000 | 63 |

In the cases of one Chicago company and Cleveland, the municipality has a direct financial interest in the property. The Detroit company is actually owned and operated by the city and the Boston Elevated is publicly operated. The Chicago Elevated is not a street railway.

The weighted average rate of all the operating companies in New England, including several which have been forced out of business by high wages, is 61¼ cents per hour. Omitting the companies involved in this case and also the state-controlled Boston Elevated, this weighted average becomes 57.79 cents per hour. The simple average hourly rate for all the companies is only 54.39 cents. Only five companies in New England are paying a one-man car operator a differential of over 5 cents per hour.

Recent arbitration boards have recognized the futility as well as the injustice of ignoring the financial condition of a street railway in wage problems. The companies point out that their "slow return to partial prosperity" may be fatally ended by the award of an overgenerous wage or by failure to reduce the existing rate, if the unreasonable attitude of the employees continues with respect to the spread of hours. The wages of the men should be fixed in the smaller associated companies at figures which the board believes will permit of possible continuance of operation.

## Anti-Freezer Works Well

IN CONNECTION with a report of the convention of the Wisconsin Public Utilities Association, published in the JOURNAL for April 26, an account was given of the discussion by A. B. Wood, Westinghouse Air Brake Company, on the problem of freeze ups in air brake lines. Mr. Wood described the construction and operation of an anti-freezing device which the JOURNAL erroneously assumed was of one type of manufacture, while Mr. Wood actually was describing the "Anti-Freezer," which is handled by another company. It was reported by several railway men at the Wisconsin meeting to have eliminated difficulty from freeze ups.

# The Railways' Competition and What It Pays

### Motor Vehicle Production and Registration Show Heavy Gains—Taxes in 1923 Claimed to Amount to Nearly Half a Billion

FIGURES compiled by the National Automobile Chamber of Commerce, some of which are reproduced in the tables herewith, show that with a total production of 4,086,997 motor vehicles in 1923, the industry had its greatest year and the number of competitors of the railways increased 53 per cent over the number in 1922. The wholesale value of the automobiles sold is placed at $1,693,808,282; of the trucks, $311,144,434, and of parts sold by motor vehicle factories, $247,443,541, making a total of $2,252,396,257. This is the revenue derived from a capital invested in the motor vehicle manufacturing business of $1,571,722,411, which indicates a capital turnover of about 150 per cent. Total sales, as above, amount to $2,804,952,716 if the wholesale value of tires and all replacement parts is added in.

TABLE I—MOTOR VEHICLE TAXES COLLECTED IN 1923

| | |
|---|---|
| **FEDERAL** | |
| 1. Passenger cars | $106,280,234.24 |
| 2. Commercial vehicles | 10,908,777.31 |
| 3. Parts, tires and accessories | 38,610,844.42 |
| | $155,799,855.97 |
| 4. Vehicles for hire | 1,907,399.55 |
| | $157,707,255.52 |
| **STATE** | |
| 1. Registration fees, including drivers' licenses | $188,947,862.97 |
| 2. Gasoline taxes | 36,813,939.61 |
| 3. Personal property taxes | 75,000,000.00 |
| | $300,761,802.58 |
| **MUNICIPAL** | |
| Municipal taxes on motor vehicles | $13,079,209.57* |
| Total motor vehicle taxes | $471.548,267.67 |

Apparently to answer a common comment that the huge investment of money in automobiles by the general public is taking money away from reservations for the rainy day, the National Automobile Chamber of Commerce presents curves showing the upward trend of savings in comparison with the growth of motor transportation, the curves showing the same general trend. The statement is made that investment by the public in motor vehicles has been accompanied during the past ten years by continual upward trend in various forms of savings. Assets of building and loan associations have tripled, life insurance in force is more than two and a half times as great, savings bank deposits are nearly double, and total individual bank deposits are at present more than twice what they were in 1913.

Another interesting part of the figures compiled by the Automobile Chamber is the amount of money collected during 1923 in motor vehicle taxes. This is claimed to amount to a grand total of $471,548,000, exclusive of property taxes on garages or local taxes levied on the retail business of selling automobiles. The federal and state figures are compiled by the United States Bureau of Public Roads, the municipal figures by the Automobile Chamber itself from reports made by city treasurers. The figures are given in Table I.

A few rather interesting deductions can be made from the chamber's figures. If an average value of $500 is placed on the 15,092,177 cars registered in 1923, there is represented a total property value of about seven and one-half billion dollars. The investment in the electric railway industry is six billion. The total taxes collected of $471,548,000 then represents an assessment of about 6¼ per cent on this value of motor vehicles.

In the ten years shown in the table, a total of 18,654,700 motor vehicles have been manufactured. As the total registration in 1923 was 15,092,177, this indicates the scrapping of 3,562,523 vehicles, or approximately 20 per cent of the total in ten years. In 1922 the total registration was 12,238,375. During 1923, 4,086,497 automobiles and trucks were sold, but the registration only increased 2,853,802. Thus there was a shrinkage of 1,233,195 vehicles or about 10 per cent in one year, indicating an average life of ten years. The true average life is probably nearer five to seven years, as will be developed with further statistics as this industry ages.

## Red Lights Losing Significance

A PECULIAR result of the universal use of red taillamps on automobiles is that the message carried by them is "turn to the left" rather than "danger." This was the conclusion of A. H. Rudd, chief signal engineer of the Pennsylvania Railroad System, in an address before the New York Railroad Club. He said in part:

"During the time we had our safety-first campaign last year, 222 of our gates were run through. I don't know how many trains were run into. I do know that in one instance a train was stopped on a crossing on the Northern Pacific, and while standing there a Ford ran into the left-hand side. While they were cleaning up the wreck, a Buick ran into the right-hand side.

"Of the 222 gates 'busted,' 60 per cent of them were in the daytime. Of the other 40 per cent, 95 per cent were broken to the left of the red light on the gates. Now, what is the answer? That the red light on an automobile means turn to the left instead of stop, and that is what these drivers did."

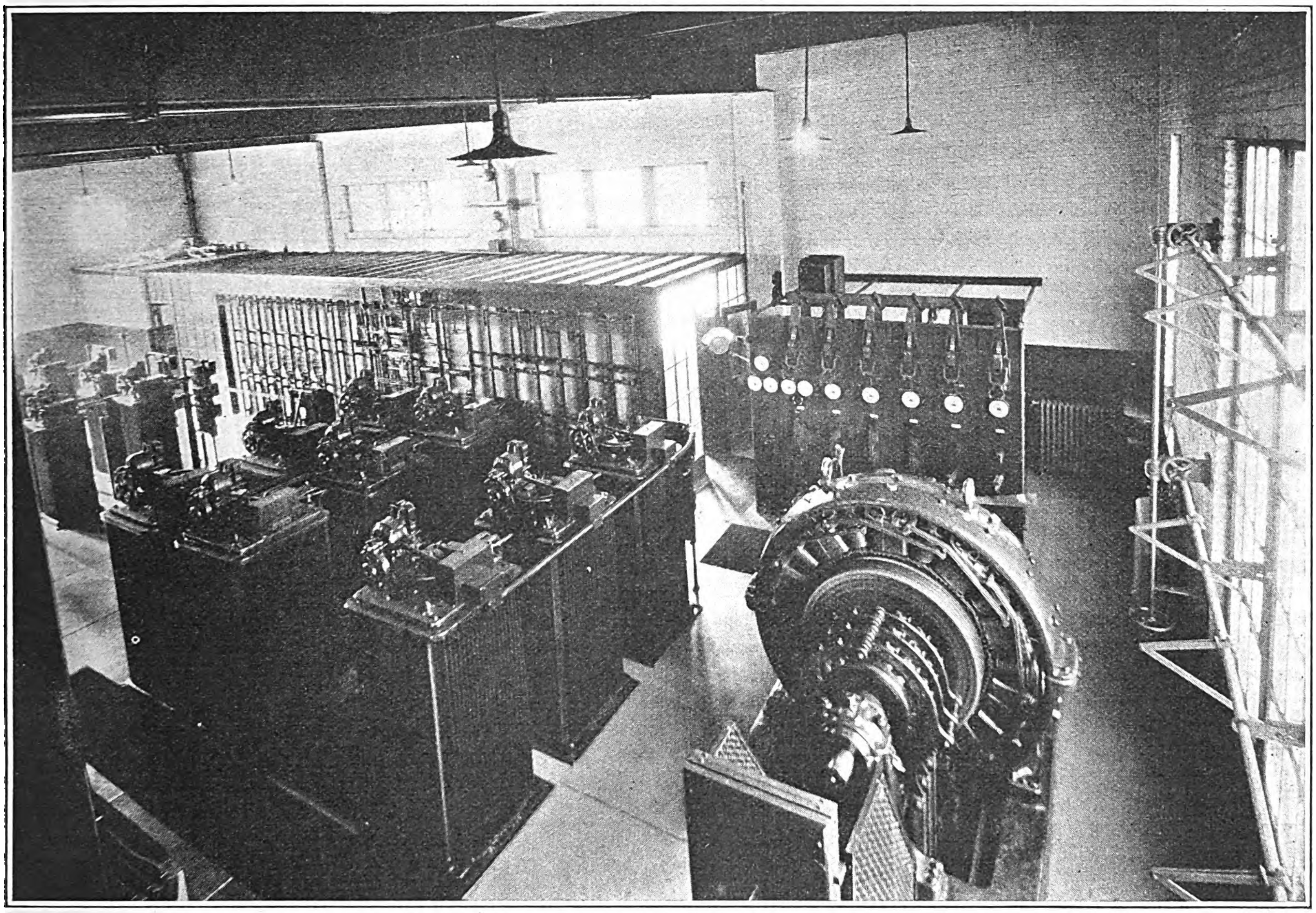
TABLE II—PRODUCTION AND REGISTRATION OF MOTOR VEHICLES IN LAST 10 YEARS

| Year | Passenger Cars Produced | | Motor Trucks Produced | | Total Motor Vehicle Production and Registration | | | |
|---|---|---|---|---|---|---|---|---|
| | Number | Wholesale Value | Number | Wholesale Value | Production | Per Cent Over Preceding Year | Motor Vehicles Registration | Per Cent Over Preceding Year |
| 1914 | 543,679 | 413,859,379 | 25,375 | 45,098,464 | 569,054 | 17.5 | 1,711,339 | 36 |
| 1915 | 818,618 | 565,978,950 | 74,000 | 125,800,000 | 892,618 | 56.7 | 2,445,666 | 43 |
| 1916 | 1,493,617 | 797,469,353 | 90,000 | 157,500,000 | 1,583,617 | 77 | 3,512,996 | 43.6 |
| 1917 | 1,740,792 | 1,053,505,781 | 128,157 | 220,982,668 | 1,868,949 | 18 | 4,983,340 | 42 |
| 1918 | 926,388 | 801,937,925 | 227,250 | 434,168,992 | 1,153,638 | —38 | 6,146,617 | 23 |
| 1919 | 1,657,652 | 1,461,785,925 | 316,364 | 423,326,621 | 1,974,016 | —7 | 7,565,446 | 23 |
| 1920 | 1,883,158 | 1,809,170,963 | 322,039 | 423,756,715 | 2,205,197 | 11.5 | 9,231,941 | 22 |
| 1921 | 1,514,000 | 1,093,918,000 | 147,550 | 166,082,000 | 1,661,550 | —24.6 | 10,463,295 | 13 |
| 1922 | 2,406,396 | 1,567,003,041 | 252,668 | 222,635,324 | 2,659,064 | 60 | 12,238,375 | 17 |
| 1923 | 3,694,237 | 1,693,808,282 | 392,760 | 311,144,434 | †4,086,997 | 53 | 15,092,177 | 23 |

† Includes as in preceding years, motor vehicles of United States design made in Canada.

# Railway and Power Substations Combined for Economical Operation

**Cicero Substation of the Chicago Rapid Transit Company and the Public Service Company of Northern Illinois Presents Example of Co-ordinated Efforts to Reduce Maintenance and Operating Costs**



Railway Company's Equipment Has Been Placed at Rear of Main Floor. Note Arrangement of A.C. Panels Forming Inclosure for Operator

THE Chicago Rapid Transit Company, which operates in Chicago and some of its adjacent suburbs, purchases all of its energy from the Commonwealth Edison Company, either as 600-volt direct current or as high-voltage alternating current, and performs the conversion service in substations of its own. The Public Service Company of Northern Illinois supplies power and light to all of the suburbs immediately adjacent to the city, and at a number of points its lines and those of the Commonwealth Edison Company are connected in substations of the Public Service Company, where energy is interchanged between them as the requirements of the two companies make it desirable.

When the Douglas Park branch of the Chicago Rapid Transit Company was extended last year a distance of ¾ mile into the town of Berwyn, it was necessary to provide a substation in order to improve the line voltage. With the growth of these suburbs—Cicero and Berwyn—the power and lighting requirements also increased, causing the Public Service Company to seek a site for a distribution center. The two companies made a careful survey of the territory and decided to combine the substation facilities in a single station adjacent to the right of way of the railway company. This substation, located at Cicero, Ill., houses the apparatus of the power company and a 1,500-kw. railway rotary converter with its switchboard and miscellaneous apparatus. By allocating the fixed and operating charges between the two companies on the basis of installed capacity, it was possible for the railway company to obtain a lower conversion rate than would have been possible if a separate building had been built.

### DETAILS OF INSTALLATION

The building was designed and built by the Public Service Company in accord with its standard type of distribution substation. It consists of a one-story brick and concrete building with basement. Provision has been made at the rear of the main floor, by heavy

I-beam construction, to accommodate the converter of the railway company. The machine is a 1,500-kw., six-phase, 60-cycle, 600-volt Westinghouse, hand-operated rotary converter. The a.c. and d.c. connections to the machine are carried through an opening in the floor, directly under the machine, which also serves as a duct for the intake of circulating air. The a.c. starting panel has been mounted a few feet from the a.c. end of the machine, while the d.c. switchboard has been placed at right angles to the axis of the machine in line with the main switchboard of the Public Service Company. The three railway transformers have been set in the yard at the rear of the building and are suitable for operation on either 12,000 or 33,000-volt service. They are connected in delta and at present are supplied with energy from the 12,000-volt station bus. Both high and low tension cables between the transformers and the installation within the building are carried in underground duct lines. The low-tension lines enter the station approximately 4 ft. above the basement floor and are carried upward to a pipe-frame rack, suspended from the ceiling. Here connection is made between the cables and copper bus bars. All connections between the converter and switchboards are made in the basement with bar copper. This conforms with the practice established by the power company and gives to the underside of the machine and to this portion of the basement a neat appearance.

### ARRANGEMENT OF SWITCHBOARD PANELS

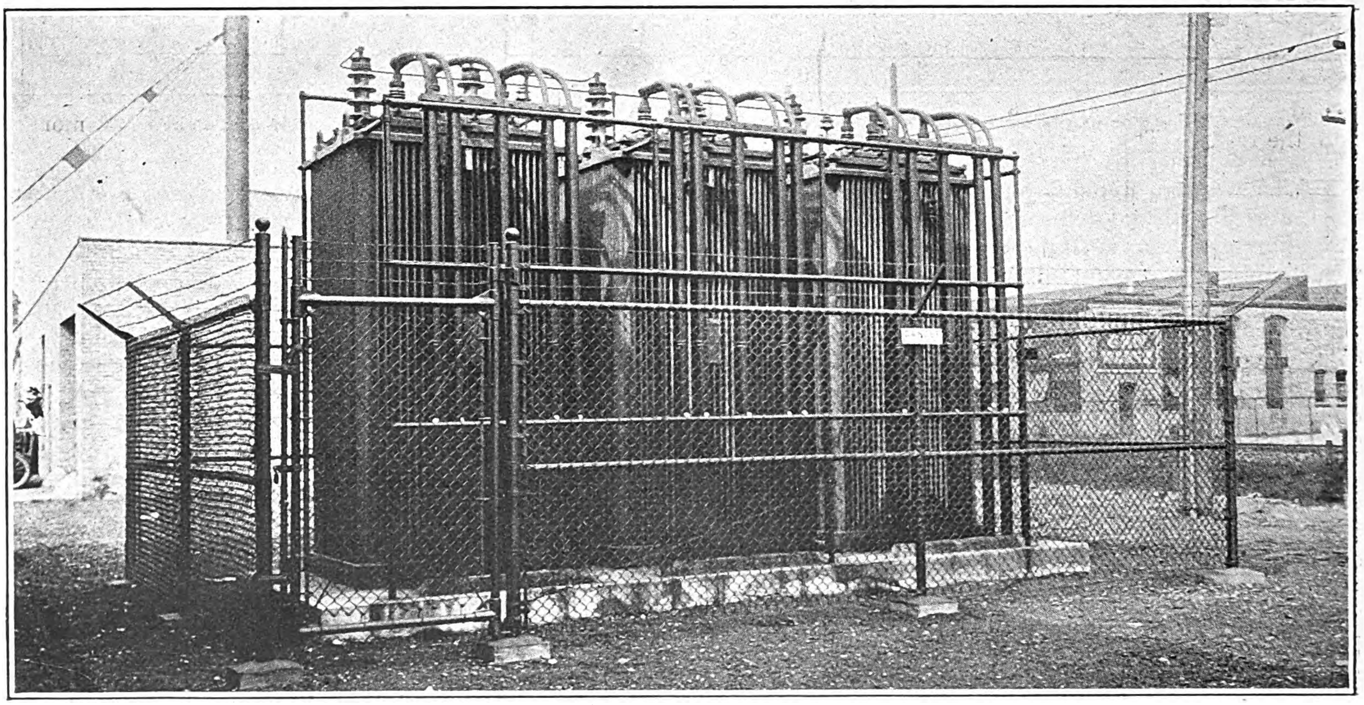
The power company uses as its standard substation design a switchboard arrangement which is different from that usually employed. The switchboard is located approximately 10 ft. from a side wall of the building with its face toward the wall. The board forms one side of a room, which is totally inclosed by means of glass partitions at the ends and a suitable roof. This is a convenient room for the operator and is the only portion of the building requiring heat during the winter.

The main switchboard of the railway company is placed in line with the power company's switchboard, but faces in the usual direction—away from the wall. This board was left out of the bank of power switchboards because the heavy circuit breakers on the top of the panels would necessitate considerably more headroom than the operator's room required. Also in the operation of railway equipment it is desirable to have the rotary in view at the time of switching. The railway switchboard consists of seven panels, namely, a.c. meter panel, d.c. machine panel, four feeder panels and one auxiliary feeder panel. On these is mounted the usual equipment for this class of service.

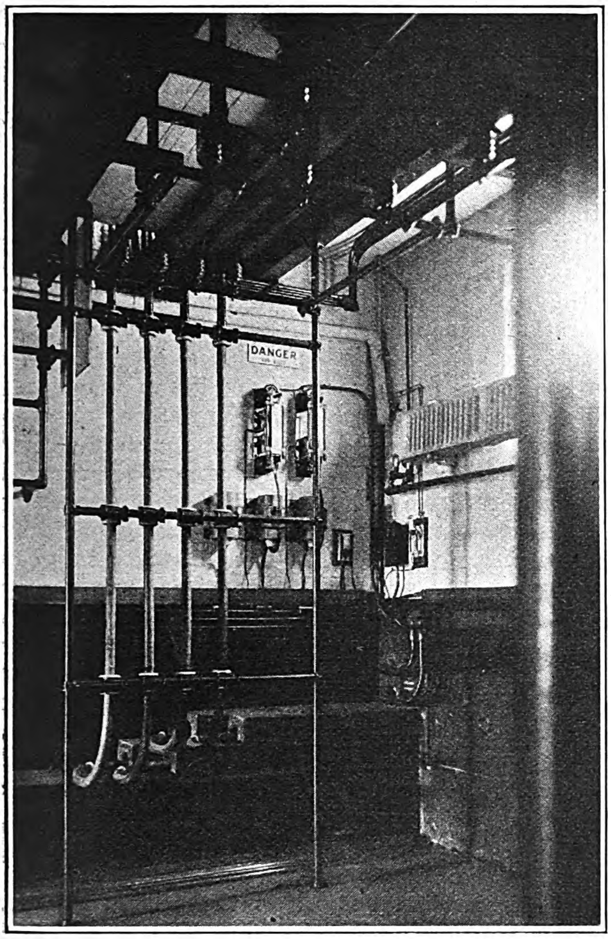
As both the Public Service Company and the Chicago Rapid Transit Company are purchasing power from the Commonwealth Edison Company at this point, the necessary metering and demand indicating equipment was installed on a common panel inside of the operator's inclosure.

### SPECIAL INTERLOCKS PROVIDE PROTECTION

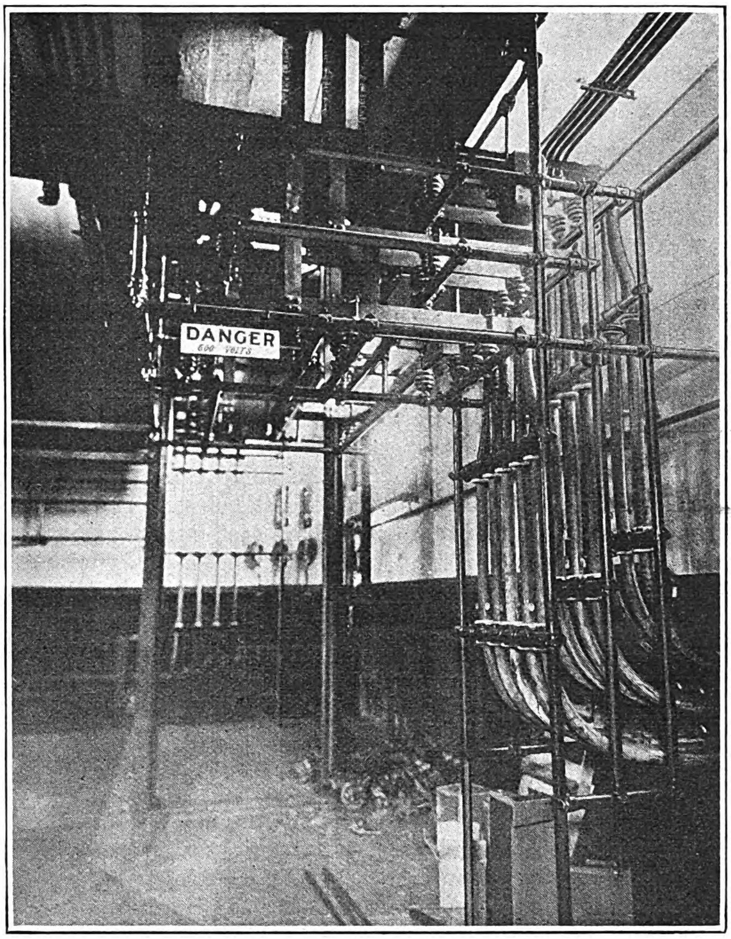
In order to provide the maximum protection against operating errors, certain interlocks were interposed in the control circuit, making it impossible for the operator to damage any of the railway equipment by faulty switching when starting up and shutting down the converter. A double pole interlock, mounted on the starting panel, in such a position that it will be actuated by the movement of the starting switch, is connected in series with the oil switch control circuit. It is necessary to have the starting switch on the starting taps of the transformers before it is possible to close the oil switch. This eliminates the possibility of throwing the full running voltage on the machine when it is standing still. In series with this same control circuit are two contacts of a double-acting interlock mounted on the machine frame. This interlock is mechanically actuated by the brush-raising mechanism on the d.c. side of the rotary and acts as an additional check on the starting of the machine. It is thus impossible to close the oil switch unless the d.c. brushes are raised. Two other contacts of this brush interlock are connected in series with the d.c. machine breaker release



**Low-Tension Leads from Outdoor Transformers Are Carried in Individual Conduit to Concrete Underground Ducts**



Entrance Into Duct Line for D.C. Feeder Cables. Connection Between Positive Bus Bars and Cables Is Made on Pipe-Frame Rack



A.C. Leads from Power Transformers Are Connected to Bus Bars on Pipe-Frame Rack. Guards and Signs Indicate Bare "Hot" Copper

trip circuit. When this circuit is open; that is, when the brushes on the machine are in the "up" position, it is impossible to close the machine breaker. This prevents the operator from starting the converter with the brushes down and assures the brushes being lowered on the commutator before connection to the d.c. bus.

The frame of the machine is insulated from the ground by means of leatheroid. However, a connection between the frame and ground is made through a relay which operates in case of a flashover from the brushes to the frame. This relay is also connected in the control circuit and drops out the oil switch and d.c. circuit breaker when a flashover occurs. This takes the converter off the line on both the a.c. and d.c. sides.

In addition to these interlocks the usual speed-limiting device is employed for taking the rotary off of the line in case of overspeed.

Due to the fact that this station is used for combined service, it was necessary to label buses as to voltage and to install barriers between bus bars of the two companies. Screens are provided around "live" parts of the switchboard.

From the d.c. side of the machine, the positive is carried on copper bars to the machine panel. The four outgoing feeder circuits are carried on copper bars from the feeder panels to a rack similar to the a.c. rack, where connection is made to the feeder cables. The negative from the machine is carried on copper bars directly to the underground duct line, where connection is made with lead-covered cables.

Four 1,500,000 circ.mil, lead-covered copper feeder cables are used for the positive and are carried in individual underground ducts from the station to the railway right-of-way. Two of the feeders are carried on a pole line some distance from the station, where they tap the third rail. The other two feeders tap the third rail directly opposite the substation. This substation is tied in on two double-end fed sections with the Harding Avenue substation and also feeds two single-end sections, extending from the substation to the end of the Douglas Park branch. As the load on this end becomes very light during the early morning hours, it is economical to shut down the Cicero rotary during this period, tying the single-end fed sections through the station. This is accomplished by closing one single-end and one double-end fed section to the main bus and the other single-end and the remaining double-end fed section to the auxiliary bus. The entire load is then carried by the Harding Avenue substation.

## Traffic Was a Problem in 1800

WE THINK of traffic as a modern problem, but on April 19, 1800, the city of Schenectady passed this ordinance:

> *Resolved*, That hereafter no carriage of any kind shall be allowed to remain in any of the streets or alleys within the jurisdiction of this Common Council after sunset, nor in the daytime for more than six hours at any one time, and that if any carriage shall be permitted to remain in any of the said streets or alleys for a longer time than is above mentioned, the owner or owners of every such carriage shall for every such offense forfeit the sum of 50 cents.

# Motor Buses and Accounting

## The Increasing Use of Motor Buses Emphasizes the Need of a Standard System of Bus Accounts—The Problem Not a Difficult One

BY M. W. GLOVER
General Auditor West Penn Railways

NOT many years ago when electric railways commenced to build interurban lines, steam railways opposed them in every way, and even today there is considerable opposition to electric interurban railways by steam railway interests. However, it has been proved conclusively that there is a field for the interurban railway and for the steam railway, and both can operate in their respective fields without seriously interfering with each other. The same thing is true of motor buses. There is a field for the electric railway and a field for the motor bus. This fact is now recognized by electric railway operators and is shown by the large number of motor bus lines now operated by electric railways as feeders. The motor bus is a common carrier and as such should be subject to the same state or federal regulation that governs other common carriers, whether operating by steam, electricity or gas.

If there is a community without adequate transportation facilities and the existing electric railway does not consider the volume of business sufficient to warrant an extension of its lines, a motor bus line should be established, and if the electric railway fails to do this, a franchise should be granted to responsible parties for the operation of motor buses to serve the community in question. In this case, the electric railway should consider the bus line as a friendly feeder rather than an unfriendly competitor.

Traffic congestion in large centers of population is another factor to be taken into consideration in any discussion of the bus problem. Will our cities be able to take care of the ever-increasing number of automobiles in their present narrow streets? Look at the experience of Akron and numerous other cities, which have tried to replace street cars with motor buses. Imagine Pittsburgh without the Pittsburgh Railways Company, or Cincinnati without the Cincinnati Traction Company, or Indianapolis without the Terre Haute, Indianapolis & Eastern Traction Company. It is safe to predict that no city can afford to abolish its street cars and substitute motor buses until such time as the "city planning commission" now being formed finds some means of widening the streets to take care of the present traffic, which is increasing daily through the use of more private automobiles and is resulting in congestion of traffic for which some solution must be found.

Many motor bus lines have failed on account of installing the wrong type of bus, but this is not an accounting matter and should be left to our friends, the engineers, to discuss.

### NEED FOR PROPER ACCOUNTING SYSTEM

The question of the proper rate of fare for a bus line will adjust itself in time and electric railway operators, who insist that a 5-cent fare is not adequate for bus service, will have the question decided on the same principle which governs all other attempts to do business at a loss. Neither a bus line nor an electric railway can continue to operate at a loss, and those who make the investment will not continue indefinitely the operation of any line which cannot pay its expenses.

So far, the principal trouble with motor bus lines has been their failure to install a proper system of cost accounting. Motor buses cannot be successfully operated without conforming to the principles of accounting, which must govern any system of cost accounting. The cost of gasoline, oil, repairs and the driver's wages have usually been considered the only operating costs. Naturally during the first few months of operation an apparent profit is shown, but this cannot continue, and when the time comes to overhaul the motor bus or when it is worn out and has to be replaced, or an accident occurs and injury to persons or property subject the bus line to a claim for damage, the fallacy of the accounting system employed is realized.

The proper remedy is to install a cost accounting system to show whether a line is making or losing money. Every element of cost must be taken into consideration. At the present time there are scarcely two motor bus transportation companies using the same system of accounts. This lack of uniformity produces income statements which, when compared with those of other lines, show ludicrous results. But they often enable the original promoters to dispose of their interests at a profit to some unsuspecting capitalist who believes there is money in operating motor buses at a lower rate of fare than is charged by electric railways for similar service. This condition can be overcome by proper regulation, and it is only just to all concerned that motor buses be subject to the same regulation as govern common carriers.

The problem of a satisfactory classification of accounts for motor buses is not difficult, as the accounting principles now followed in all classifications for common carriers authorized by State or Federal authorities conform to standard accounting practices, and it is a simple matter to prepare a classification of accounts for motor buses based on the standard classifications now in effect. The classification committee of the American Electric Railway Accountants' Association has made a study of this matter and has taken up with representatives of the Interstate Commerce Commission the question of a standard classification to be adopted for use of electric railway line which may find it necessary or desirable to commence the operation of motor buses.

A uniform classification which could be used for motor buses operated by electric railways, as well as for motor buses operated by independent interests and not subject to the Interstate Commerce Commission, is very desirable and necessary, but it will be difficult to provide a classification which will be used by all motor bus companies. A number of states have already issued regulations covering a classification of accounts for motor buses, and there is a marked difference in the classifications now used, making it impossible satisfactorily to compare the results of operations of the different companies. It is possible to use the present standard classification of accounts for electric railways, with a few subdivisions, to cover motor bus operations. In fact, the operating accounts used by some of the largest independent motor bus companies in the country are based on the Interstate Commerce classification for electric railways.

It would be manifestly unfair to adopt a classification of accounts suitable for a company operating several hundred buses and attempt to have this classification used by a company operating less than a dozen buses. Therefore, any system of accounts should provide a condensed classification for small companies and a more elaborate classification for large companies.

Should the Interstate Commerce Commission issue a satisfactory classification for motor buses, it should be used by all companies operating buses, whether they report to the Interstate Commerce Commission or not, and if State or Federal regulation is applied to motor buses, electric railways have nothing to fear.

When an electric railway decides to operate buses, it will be found more satisfactory to organize a separate company than to operate them as a part of the electric railway, and this has been done by many lines.

Finally, the attitude of electric railways to motor bus transportation is well stated by A. C. Blinn of the Northern Ohio Traction & Light Company:

> Just remember one thing: This company—the Northern Ohio Traction & Light—is in the transportation business!
>
> When the horse cars gave way to the electric cars this company changed over to electric motive power. When the electric car gives way to the bus, if it does, this company will still be in the transportation business, operating buses!

# Plans for New York Suburban Transit

### New Transit System Proposed by Which Suburban Trains Can Run Directly Into New York Through a Union Terminal Distributing System —To Be Entirely Independent of City System

LAST week the New York Transit Commission published a report by its consulting engineer, Daniel L. Turner, on the problem of suburban transit in the New York Metropolitan district. It is the first official report of a comprehensive nature put out by the New York Transit Commission to include New Jersey. The rapid transit system proposed is entirely separate from any of the existing rapid transit lines in New York, and its main purpose is to serve the suburban commuter from the north, east and west, who now largely uses the existing rapid transit lines after reaching the city.

The proposed system puts the junctions between the rapid transit distributing lines and the steam (or electrified) main line railroads in all cases outside of Manhattan Borough, and in the case of the New Jersey lines away from the Hudson River. This is because of the high value of real estate in Manhattan and on the river front. The plan does not contemplate an abandonment of the present main line railroad terminals. The Grand Central and Pennsylvania stations in New York City and the Erie, Lackawanna and West Shore Railroad stations in Hudson County, New Jersey, would be kept, but used primarily by long distance passengers.

The New York Transit Commission says that the plan is entirely tentative in character and in an informal stage. It is submitted to the various public authorities concerned, as well as to the railroad companies and civic bodies generally, for examination and comment. An abstract follows:

## EXTENT OF SYSTEM

The railroad services entering New York accommodate approximately one-quarter of all the steam railroad passenger traffic in the country, and about 82 per cent of all the trains required daily to serve this traffic originate within about 40 miles of the city. Therefore, roughly, the suburban railroad traffic into and out of New York City amounts now to about 20 per cent of all the steam railroad traffic in the United States. As the number of these commuters is increasing rapidly, special transit facilities must be provided for them; otherwise they will soon saturate the steam railroad facilities and seriously interfere with the existing city transit lines in transporting purely city traffic.

The population of the Metropolitan transit district, as outlined in the accompanying maps and as represented approximately by territory included within 40 miles of New York City Hall, amounted in 1920 to about 8,600,000 people. Of this number, approximately 3,000,000 live outside of New York City and 5,600,000 within the city. It is expected that in 1924 this total population will have increased from 8,600,000 to 9,300,000; in 1930 to 10,500,000, of whom about 3,900,000 will be suburbanites; and in 1950 to 17,000,000, of whom about 7,000,000 will live outside the present limits of the city of New York. In 2000 it is expected that the population will approach 35,000,000, of whom about 22,000,000 will live outside the city limits. The population density of the various counties and boroughs making up the district in 1920 is shown in the accompanying map.

TABLE I—ANALYSIS OF PASSENGER TRAFFIC ENTERING AND LEAVING NEW YORK DELIVERY AREA

| | 1923 | | Per Cent of | | | | |
|---|---|---|---|---|---|---|---|
| Sectors | Number of Passengers Yearly | Daily | Total | Commuter | Regular | Sector (a) | Sector (b) |
| Long Island: | | | | | | | |
| Railroad | | | | | | | |
| *Commuter | 52,000,000 | 162,000 | 15 | 33 | ... | 68 | 68 |
| Regular | 25,000,000 | 78,000 | 7 | ... | 25 | 32 | 32 |
| Sector total | 77,000,000 | 240,000 | 22 | 33 | 25 | 100 | 100 |
| Westchester: | | | | | | | |
| Railroad | | | | | | | |
| *Commuter | 28,000,000 | 87,000 | 8 | 18 | ... | 61 | 61 |
| Regular | 18,000,000 | 56,000 | 5 | ... | 18 | 39 | 39 |
| Sector total | 46,000,000 | 143,000 | 13 | 18 | 18 | 100 | 100 |
| New Jersey: | | | | | | | |
| Railroad | | | | | | | |
| *Commuter (c) | 78,000,000 | 244,000 | 22 | 49 | .. | 34 | 58 |
| Regular (c) | 56,000,000 | 175,000 | 16 | ... | 57 | 24 | 42 |
| Railroad total (c) | 134,000,000 | 419,000 | 38 | 49 | 57 | 58 | 100 |
| Ferry (d) | 56,000,000 | 175,000 | 16 | ... | ... | 24 | . |
| H. & M. | 43,000,000 | 134,000 | 11 | ... | ... | 18 | . |
| Sector total | 233,000,000 | 728,000 | 65 | 49 | 57 | 100 | 100 |
| *Total commuter | 158,000,000 | 493,000 | 45 | ... | ... | ... | ... |
| Total regular | 99,000,000 | 309,000 | 28 | ... | ... | ... | ... |
| Total railroad | 257,000,000 | 802,000 | 73 | ... | ... | ... | ... |
| Grand total | 356,000,000 | 1,111,000 | 100 | 100 | 100 | ... | ... |

(a) Includes ferries and Hudson & Manhattan.

(b) Excludes ferries and Hudson & Manhattan.

(c) Includes Staten Island Rapid Transit Co. St. George passengers—Commuter, 2,844,118; regular, 8,286,635; total, 11,030,382.

(d) Includes Staten Island-Manhattan ferry passengers but not railroad St. George passengers.

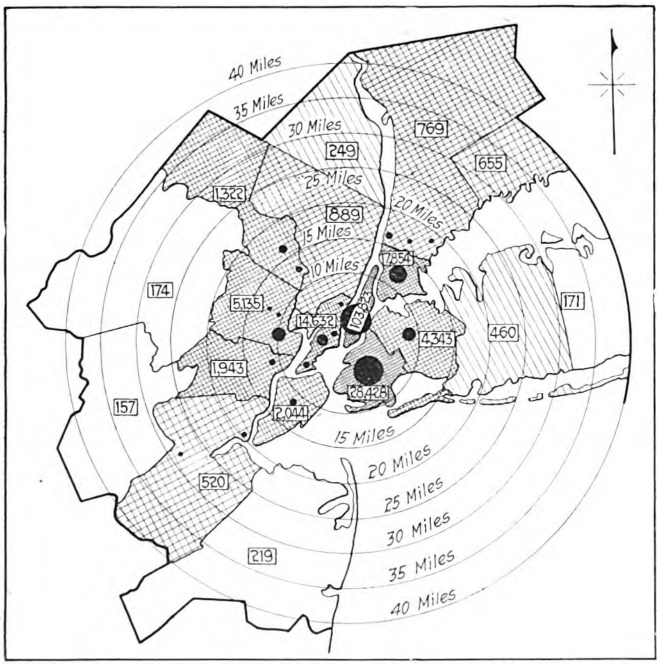
*Commuters are all riders at less than the regular fare.

In one respect the distribution of the population in this district in New Jersey differs from that in New York State outside of New York City. The New Jersey sector has thirteen cities with a population of 30,000 or over, and a total population of 1,382,000. This means that a large proportion of the population in this sector has a local community interest and that a considerable measure of decentralization exists. Such a condition should be encouraged. In the Westchester section, on the other hand, there are only two cities having a population of 30,000 or more, and the total urban population in these cities is only 179,000, so that decentralization does not obtain in this sector to the same degree as in New Jersey.

An analysis of the passenger traffic entering and leaving this railway district is shown in the accompanying table. During the rush hour from 8 to 9 a.m., 243 trains arrive in the city from all sectors. This figure does not include the trains on the Hudson & Manhattan Railroad. Eighty-four of these trains arrive within this same hour, so that the total train arrivals amount to 327 trains in a single hour inbound. About 89 per cent of these trains originate within the Metropolitan transit district.

### METROPOLITAN TRANSIT SYSTEM

To accommodate the suburban traffic originating on the steam railroads traversing the metropolitan transit district, it will be necessary to do one of two things. One is to provide additional terminals in the central business district for the accommodation of this rapidly increasing suburban traffic, thereby relieving the district terminals; the other is to shunt all of the suburban traffic past existing terminals and provide a separate and independent collecting and distributing system traversing central Manhattan for the exclusive use of suburbanites now served by the existing steam railroad lines.


40 Miles
35 Miles
30 Miles
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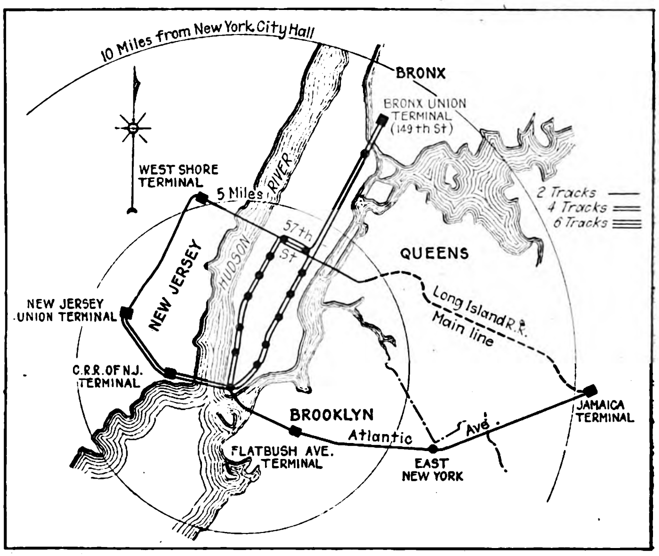
20 Miles
25 Miles
30 Miles
35 Miles
40 Miles
769
249
655
1,322
889
17,854
174
5,135
14,632
103,823
4,343
460
171
1,943
28,428
2,044
157
520
219

**Metropolitan Transit District, Showing Present Distribution of Population**

Figures are based on Federal census figures for 1920 and show number of people per square mile. The total population of each New York City borough and of 15 municipal cities adjacent to New York City is shown graphically by circles, the areas of which are proportional to number of population.

It will be a mistake to follow the first of these alternatives. This would only mean concentrating the suburban traffic at a few separate points, just as is now done, creating congestion worse than now exists. From these points the passengers would have to reach their destinations over the city's transit facilities, thereby throttling these facilities and prohibiting them from properly serving the areas within the limits of New York City that they were designed primarily to serve.


10 Miles from New York City Hall
BRONX
BRONX UNION TERMINAL (149th St)
WEST SHORE TERMINAL
5 Miles
HUDSON RIVER
57th St
2 Tracks
4 Tracks
6 Tracks
QUEENS
NEW JERSEY
NEW JERSEY UNION TERMINAL
Long Island R.R. Main line
C.R.R. OF N.J. TERMINAL
BROOKLYN
Atlantic Ave.
JAMAICA TERMINAL
FLATBUSH AVE. TERMINAL
EAST NEW YORK

**Metropolitan District, Showing Proposed Transit System**
Circles represent distances from New York City Hall.

### PLAN PROPOSED IS INTERSTATE

The plan proposed is shown in the accompanying illustration. It contemplates about 40.5 miles of route and 123 miles of single track. It may be described as consisting of three separate lines. One of these serves the Long Island sector to the east of the city. Another serves both the Westchester section to the north and the New Jersey section to the west, and the third serves the New Jersey sector only. The three lines generally described are:

1. The Long Island begins at Jamaica, passes through Flatbush terminal and under Battery Park, then north on the west side of Manhattan to Fifty-seventh Street, then east under the East River to Sunnyside Yards.

2. The Westchester-New Jersey line begins in the Bronx at a union suburban terminal to serve the New York Central, New Haven & Harlem lines, then south to Fifty-eighth Street, where it divides. One of these lines goes on the east side to Battery Park, thence under the river to the New Jersey terminal, to receive trains of the Lackawanna, Erie and Pennsylvania Railroads. The other branch goes west from Third Avenue and Fifty-eighth Street to Ninth Avenue, then south to Battery Park, where it terminates.

3. The New Jersey line begins at the New Jersey union terminal mentioned, then goes under the Hudson to Battery Park and up on the east side to Fifty-seventh Street, thence under the Hudson River again to Weehawken and the West Shore terminal, then back to the New Jersey Union Terminal. This provides an uptown as well as a downtown service for New Jersey commuters.

It is proposed to operate through trains through this tunnel and then over the suburban lines, which would be electrified. In the case of lines not electrified, trail cars, hauled in the tunnel by electric locomotives, can be operated.

For the routes of the rapid transit lines on the east and west sides of New York, it was considered essential to find a location which would not interfere with the expansion of the city's rapid transit facilities. This meant either that the new system must be carried at a deep level or new traffic arteries must be opened up. It was found that if the second course was followed, the saving in construction costs through having the lines near the surface would pay two-thirds of the cost of the street openings. Mr. Turner proposes that one of these 120-ft. streets be between Second and Third Avenues on the east side and the other between Ninth and Tenth Avenues on the west side. He also proposes three levels of traffic. Below the surface would be the rapid transit line, on the surface level local vehicle traffic, and on an upper deck express motor vehicle traffic. During the night hours, particularly in the theater district, the surface level could be given over to the parking of automobiles. Access to the upper level would be by ramps.

### FINANCING OF PROJECT

Mr. Turner estimates the cost of the project at $687,000,000, divided for construction $502,000,000; for equipment $185,000,000. He suggests that the construction costs be raised as follows:

| | |
|---|---|
| State of New York | $36,900,000 |
| State of New Jersey | 48,400,000 |
| Nineteen counties benefited | 278,700,000 |
| Seventeen railroads involved | 138,000,000 |
| | $502,000,000 |

He suggests the sums payable by the states and counties be collected in eight equal installments and be raised by taxation. The equipment cost, to include line equipment, power and transmission, yards, repair shops and cars, is estimated at $185,000,000.

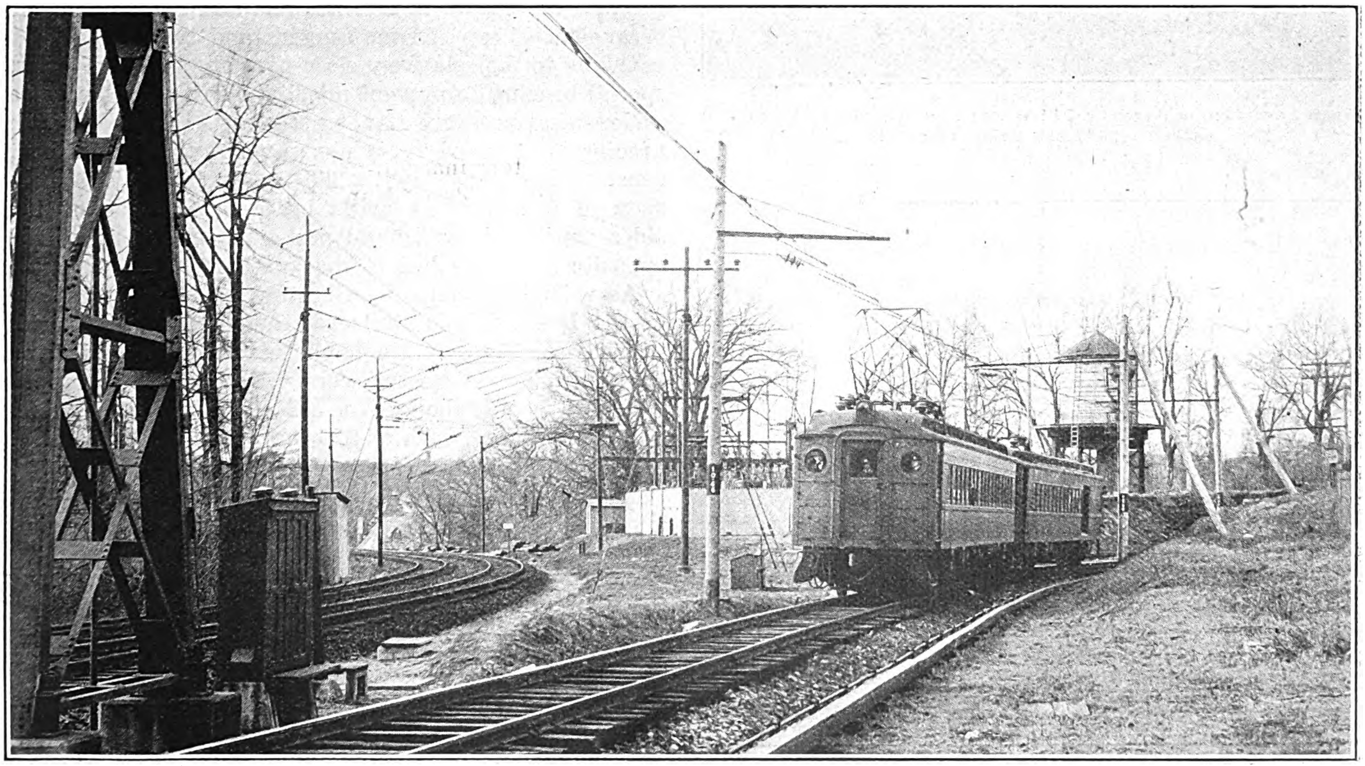
While it is difficult to arrive at any close estimate of the cost of service on the new system, it is believed that the total cost, including operating expenses and fixed charges, would amount to about 10 cents on a 400,000,000-passenger basis and about 6⅔ cents on a 600,000,000-passenger basis. This includes interest and amortization charges only on $323,000,000, or for the cost of the equipment and the cost contributed by the railroads. On the other hand, if all the cost should be financed under the usual long term bond plan, the fare would have to be about 18 cents.

Of course, some of the present expenses to the commuter would be reduced or disappear.

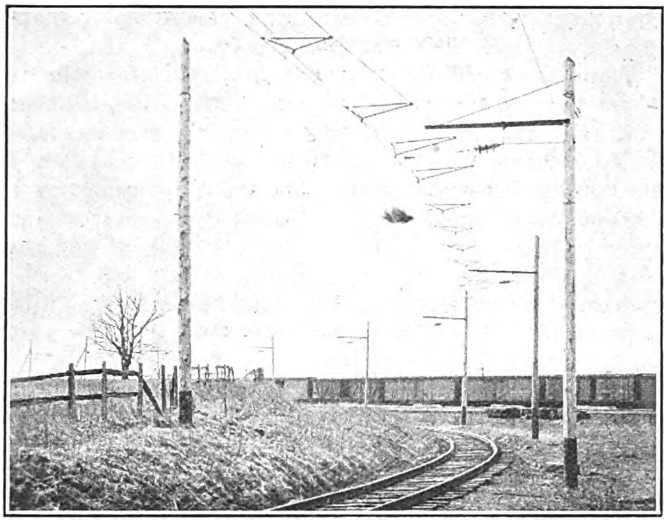
# Philadelphia Electrification Extended

### Pennsylvania Railroad Equips Its Fort Washington Branch for 11,000-Volt, Single-Phase Operation —No New Rolling Stock or Electrical Equipment Was Needed

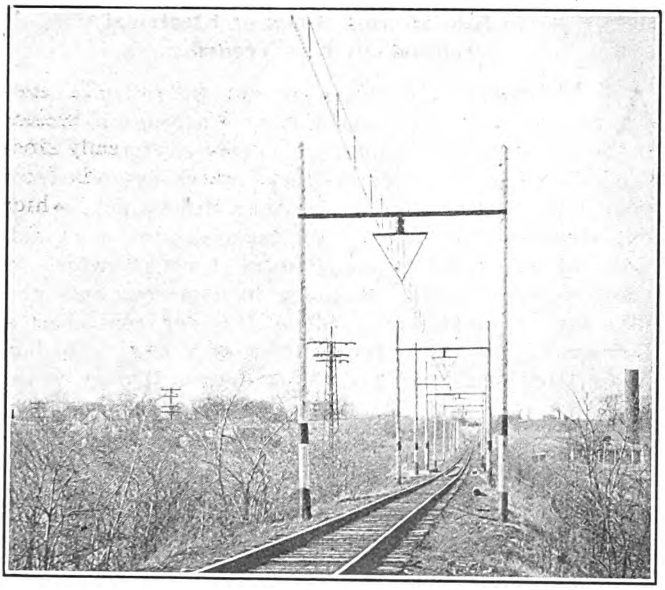
AN INTERESTING development in railroad electrification is that on the Fort Washington branch of the Pennsylvania Railroad, operated electrically since Feb. 27, 1924. This single-track branch extends from Allen Lane station, on the Chestnut Hill branch, which was electrified in 1918, to Whitemarsh station, a distance of 6.2 miles. The country through which it passes is very rolling, resulting in numerous cuts and fills, with a maximum grade of 1.5 per cent over a distance of 2.6 miles; four curves of 2 deg. to 9 deg. obtain, the latter being 1,200 ft. long. It was necessary only to install an overhead catenary system, the existing substation at Allen Lane being adequate to handle the additional load.



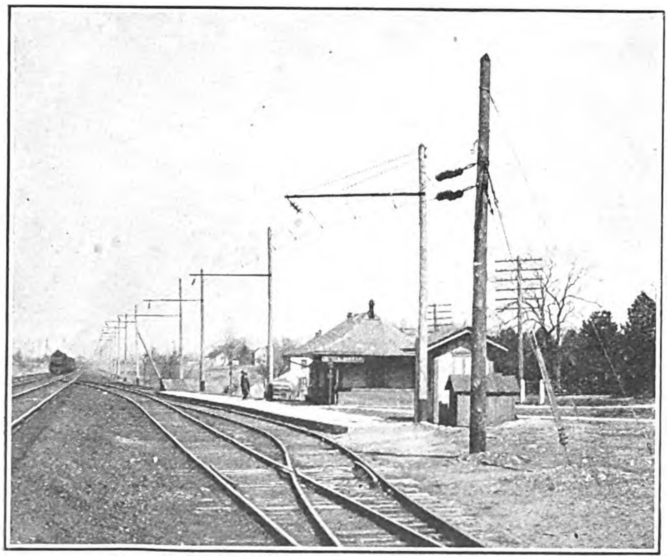
Junction of Fort Washington Branch with Chestnut Hill Line at Allen Lane. The Existing Transformer Station Which Feeds the Line Is Shown in the Background



Overhead Construction on 9-Deg. Curve, Using Single String of Insulators and Double Messenger



Span Construction Across a Fill Where Back Guying of Poles Was Not Feasible. Note the Triangular Wind Braces



Whitemarsh Station, the Terminal of the Electrified Line, Showing Standard Bracket Overhead Construction

By electrifying the branch in this manner, the existing service could be handled at less expense than by steam or by any self-propelled cars, considering all fixed charges and operating expenses. The expense of constructing the overhead line was offset by the fact that it was not necessary to provide any additional electric car equipment, the existing equipment being sufficient by proper adjustment of the train schedule. The present schedule provides six trains in each direction daily, two of which run to and from Broad Street station, Philadelphia, and the remainder terminate at Allen Lane, at which point connection is made with electric trains of the Chestnut Hill branch to and from Broad Street station. The trains consist of from two to five cars.

All the work of electrification except pole setting was done by the regular linemen, who maintain the overhead wire structures on the Paoli and Chestnut Hill electrifications, under the motive power department of the Philadelphia terminal division.

Western cedar poles, normally spaced 125 ft., with angle side brackets, support the standard catenary wire system, made up of ½-in. galvanized steel messenger wire, No. 00 copper auxiliary wire, No. 000 phonoelectric contact wire, $\frac{3}{16}$-in. x 1-in. galvanized hangers, and No. 0000 copper return wire attached to each bracket at the pole. The poles are back-guyed with ⅜-in. galvanized steel wire. Approximately every half mile the end of the bracket is guyed to adjacent poles on each side. A high fill with steep slope on each side necessitated span construction for a distance of about 1,300 ft. Opposite poles were tied together at the top by double angles which support the insulator; these bents were spaced 250 ft.

Around the 9-deg. curve poles are spaced about 100 ft. and special construction was necessary to prevent excessive vertical rise of wires due to pantograph pressure. This was accomplished by installing a second messenger wire supported from the insulators to which the first messenger is attached and a triangular hanger arrangement between messengers and trolley.

Owing to the relatively close normal spacing of poles, special bracing to prevent misalignment of trolley wire under wind pressure is not necessary. However, such bracing is provided at each span where the special bent construction is used with 250-ft. spacings. This consists of a triangular angle brace having one of the sides supported by a rigid post-type insulator and the opposite apex attached to the auxiliary wire.

As with the Paoli and Chestnut Hill electrifications of the Pennsylvania Railroad, the trolley wire carries 11,000-volt, 25-cycle, single-phase power for operating the multiple-unit electric cars. Each car is equipped with two Westinghouse No. 412-A single-phase, series-repulsion motors, each of 225 hp. hourly rating.

## Diplomas for Clean Subway Stations

A COMPETITION was held during the last six months of 1923 to see which of the stations on the Underground Electric Railways of London, England, could be kept in the smartest condition. At the stations on each line where the staff have distinguished themselves for courtesy, tidiness and general good conduct, silver mounted diplomas have been issued, and will be exhibited in the station booking hall. In all, ten such diplomas were issued covering the five main lines of the system.

# Observations on the Track Structure

## Relative Advantages of Various Types of Flexible and Rigid Construction—Opinion Expressed as to Type to Be Built to Meet Various Conditions—Causes of Disintegration Are Discussed and the Beneficial Possibilities of Standardization Touched On

*By H. P. Hevenor*
Consulting Engineer, New York, N. Y.

UPON the elimination of the old wooden stringer type of track construction in paved streets the idea was evolved of using transverse pieces of wood placed every so often, known as ties. Shortly thereafter the Dick Kerr or other type of girder rail took the place of the old-fashioned stringer rail. These basic principles developed into a generally used type of construction such as is shown in Fig. 1. The wooden ties, 6 in. x 8 in. x 8 ft., spaced on about 2-ft. centers, were tamped on a gravel or broken stone ballast. A concrete paving base between and over the top of the ties was used when necessary to support a block pavement on a sand cushion with tie rods spaced about 6-ft. centers.

The type of construction described above became generally used throughout the country for railway track in paved streets and, as time went on, received a number of modifications by different engineers. It has been developed sometimes into a very costly assembly, as for example in the old Detroit type and the new Toronto design. These modifications were brought about principally on account of conditions of the local subsoil. Construction which consists of 6-in. x 10-in. x 6-ft. 8-in. white oak ties spaced on 3-ft. centers, supported on an 8-in. concrete mattress, costs about $100,000 per mile of single track. The ties are brought to line and grade by tamping a 1-in. sand cushion underneath. The space between and over the ties is then filled in with poured concrete to a sufficient depth to support a brick paving on a sand cushion.

In the old type a 7-in. 90-lb. T-rail was used with granite nose stones providing the groove. This was modified later in Toronto by using a 7-in. modified girder rail and eliminating the granite or brick nose blocks. The first cost of the original assembly in Detroit was very high, and its comparatively short life and high maintenance requirements and the climate in which it is used made it an expensive design. This is shown in Fig. 2. A cross-section of one of the standards used in Toronto is shown in Fig. 3.

### TREND TOWARD SUBSTITUTE TIES

High cost of track and paving materials, the comparatively poor quality ties that are now obtainable and the high wages of labor for construction and maintenance have been important factors in creating a demand for a better type of track assembly. Higher speed of operation and the quicker acceleration and braking of the present-day cars have augmented the demand. The original basic type of track construction is a form of flexible structure, capable of accommodating the wave action in the rail. In steam railroad practice this principle is demanded in the entire structure.

Because the better grades of wood ties were becoming scarcer and more expensive every year, steel ties were introduced. They are being used more all the time, with every likelihood of the demand for them becoming greater. With their use new principles have been introduced and there has been a strong tendency toward a more rigid type of track construction. In a few instances this has been developed into an absolutely rigid type.

Providing that it is conscientiously built and maintained, the track assembly depreciates mostly from the following causes:

Surface water entering the structure between rail and paving.

Poor drainage of sub-soil.

Water seepage into the track assembly through adjacent paving.

Improper type of track and paving assembly to meet climatic conditions.

If a flexible track assembly and a form of rigid track paving are used, in a comparatively short time a line of cleavage is invariably established at the point where the paving meets the rail. As time goes on the surface water finds entrance to the lower structure and subjects the rail, rail fastenings, ties, spike holes and the concrete paving base to the mercy of water and frost, with disastrous results.

### FLEXIBLE PAVING TO GO WITH FLEXIBLE CONSTRUCTION

A good type of construction, therefore, when using the flexible track principle, is to apply a hot asphalt filling over granite block paving, allowing a considerable quantity of this plastic to accumulate on top of the blocks and covering it with hot beach gravel, Fig. 4. A semi-flexible track construction may be obtained by using steel ties with a small granite block paving and an asphalt filling applied in the same manner as stated above.

For an absolutely rigid type of track structure, steel ties laid in poured concrete may be used with a compressed concrete top for the wearing surface. This kind of concrete is the only paving which absolutely adheres to and seals the rail during its life. If an asphalt surface is desired when using compressed concrete paving, it is necessary only to lower the top surface 2 in. or 3 in. to accommodate the asphalt. However, because of the wide tread and flange of the standard 7-in. grooved girder rail this does not impair the grip of the concrete adjacent to the rail.

The bitulithic concrete paving structure laid in conjunction with wood ties, which is being quite extensively used in Los Angeles, seems to combine a flexible form of paving with a flexible type of track construction. Moreover, it appears to be a solution of the problem of building track under traffic, and has the advantage of being a sealed track structure. A cross-section of the bitulithic construction as used in Los Angeles is shown in Fig. 5. It was described in detail in ELECTRIC RAILWAY JOURNAL for May 19, 1923. Some foreign engineers who examined this work and were very strongly impressed with its possibilities stated that they fully intended to use this principle in their own countries. In their opinion it was a step in the right direction, as they are required by the local authorities to build the track under traffic. The most prominent question that seemed to be in their minds was the tendency of vehicular traffic to skid on this paving when it was wet, which, however, is the case on all asphalt surfaces. In the places where they intended to use it there is considerable fog and rain, but with a compressed surface, skidding is largely eliminated under wet conditions.

In doing any track laying or reconstruction, one of the first questions to be asked is, Does the track have to be laid under traffic? If it does, it means not only high labor cost, including night work, but also uncertainty concerning the permanency of the work. When it is necessary to do it under traffic, the question arises, Can any or all of the cars be rerouted, can a single-track operation be arranged on a double-track line by using temporary crossovers around the work, or is there any possibility of laying a temporary track alongside the job?

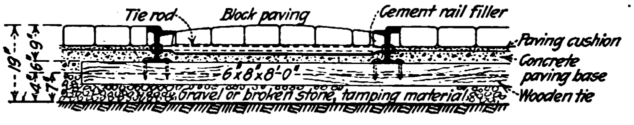

Tie rod
Block paving
Cement rail filler
Paving cushion
Concrete paving base
Wooden tie
6"x8"x8'-0"
Gravel or broken stone, tamping material
19"
4½"
6"
9"
7½"

**Fig. 1—A Basic Type of Track Construction Used in Paved Streets**

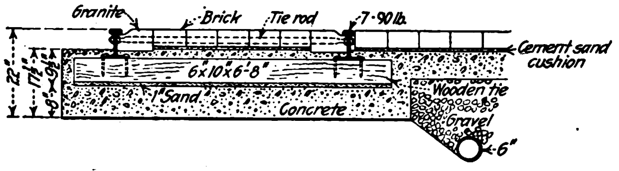

Granite
Brick
Tie rod
7-90 lb.
Cement sand cushion
6"x10"x6'-8"
1" Sand
Concrete
Wooden tie
Gravel
6"
22"
17½"
9½"
8"

**Fig. 2—Standard Construction of Detroit United Railways**

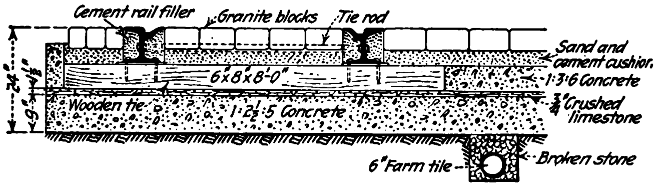

Cement rail filler
Granite blocks
Tie rod
Sand and cement cushion
6"x8"x8'-0"
1:3:6 Concrete
¾" Crushed limestone
Wooden tie
1:2½:5 Concrete
6" Farm tile
Broken stone
24"
9"

**Fig. 3—Track Construction of the Toronto Transportation Commission Using 7-In. Grooved Girder Rail**

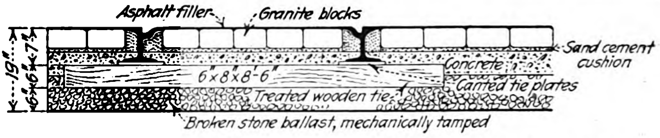

Asphalt filler
Granite blocks
Sand cement cushion
Concrete
6"x8"x8'-6"
Canted tie plates
Treated wooden tie
Broken stone ballast, mechanically tamped
19"
6"
6"
7"

**Fig. 4—An Asphalt Filler on Paving Blocks Protects This Flexible Track Construction from Surface Water**

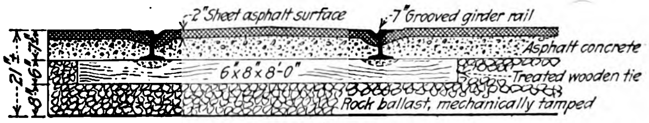

2" Sheet asphalt surface
7" Grooved girder rail
Asphalt concrete
6"x8"x8'-0"
Treated wooden tie
Rock ballast, mechanically tamped
21½"
8½"
6"
7½"

**Fig. 5—Asphalt Paving on Bitulithic Concrete in Track Construction Used by the Pacific Electric Railway, Los Angeles, Cal.**

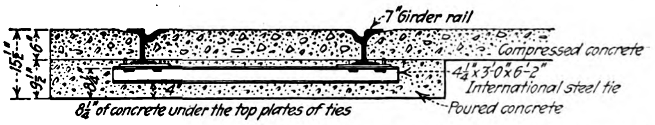

7" Girder rail
Compressed concrete
4¼"x3'-0"x6'-2"
International steel tie
Poured concrete
8¼" of concrete under the top plates of ties
15½"
6"
9½"
8¼"
4"

**Fig. 6—Monolithic Steel Tie Track Construction Which Keeps Out All Surface Water**

Operating officials often answer, "No, we are unable to reroute on account of inconvenience to the public, and the special work is not conveniently located to do so. These lines are too busy to allow single-track operation around the work, especially during rush hours." Or the city may not allow an additional track to be laid adjacent to the work. It is necessary then to make the best of a bad proposition.

In my opinion no track should be built with cars operated on it continuously. City authorities often are greatly to blame for not allowing railways to reroute their cars or use other methods at their disposal to install the work properly. However, the municipalities are now seeing the light and are being educated to the situation. They see that track may have to be laid only twice under proper conditions instead of possibly three times when these restrictions are imposed. As one old roadmaster said, "For every day they give me without traffic, up to two weeks from the time the work is completed, I figure an extra year on the life of my track."

### A FEW SUGGESTIONS ON DRAINAGE

In looking over the track construction in different communities, one sees some very odd phenomena. Irregularities are explained as being due to soft spots, or the kind of soil, or to some condition that existed before a way was discovered to cope with local sub-soil conditions. Some railways have a sandy gravel foundation throughout their entire territory with very few soft spots. Others have a saturated soil underneath their structures all the time. On the other hand it has sometimes been found that it was not the soil but the design of the track structure which allowed surface water to seep through and give no end of trouble in the winter time. By using an absolutely sealed track structure, trouble of this character can be entirely eliminated.

Another way to cope with the conditions of saturated soil is to introduce dry blind drains, using crushed stone. Some railways use a field tile or glazed clay bell and spigot pipe laid in a crushed-stone trench; and in other cases, where the soil is particularly bad, 6 in. to 10 in. of broken stone is laid the entire width of the trench on which the track structure is built.

In constructing a trolley track with paving, the existing sub-soil should normally be as little disturbed as possible. In other words, the excavation for the track structure should be as shallow as is permissible because paving and traffic have dried out and compacted the surface of the earth to a reasonable depth under an existing road or thoroughfare, and the value of this is lost if the excavation is too deep. Suggested types of construction call for an excavation from 15½ in. to 24 in. All sub-soil should be compacted with a roller as heavy as practicable under the conditions. A method often used on clay soils is to put a few inches of cinders, slag, or broken concrete material over the clay to facilitate the rolling.

A monolithic type of structure on any soft form of foundation using a steel tie with a steel rail entirely incased in concrete is good, Fig. 6. This gives a form of reinforced concrete structure with the coefficient of expansion practically the same throughout, as it is completely incased and protected against the elements. It is laid on this kind of soil as a mattress with a blind drain, or with a soil pipe, as the conditions may demand. This type of structure is very cheap in first cost and lasts throughout the life of the rail.

Steel ties lend themselves very nicely to improving the electrical return circuit. Spot-welding them to the rails, four or six to a 60-ft. rail, is an insurance against leakage from the return circuit in the event of a bad joint or a broken rail, and is a good protection against electrolysis action on adjacent structures.

Wood tie track structure lends itself to easy removal. This question was once commented upon by an official prominent in street railway circles when comparing this construction to that with steel ties. The quick response of his engineer, however, was, "We don't build track for the purpose of taking it up, but to carry cars as long as possible." The executive conceded that his engineer was right. A steel tie structure of an approved type is harder to remove than the wooden tie structure, but if its life is considerably greater, that is not a serious objection. With improved equipment and manual labor reduced to a minimum the cost of construction and reconstruction is decreasing in spite of the rise in price of materials and labor. In fact, this is the evidence that the value of the engineer to his company is rising every day as conditions become more complex.

The kind of traffic which is to pass over the track is a very important factor. The light single-truck safety car seems to subject the rail to almost no wear at all except on curves and then to only very slight wear, compared to the heavy double-truck car. Big interurban cars and trolley express cars subject the track to severe wear, especially if they are operated in paved streets. This naturally brings the question to mind, Should the heavy types be operated over paved streets at all? When they are they certainly put a severe strain on a flexible type of track, causing its rapid depreciation. It does not, however, affect a properly designed rigid type of track construction.

A practice sound in theory and proved by actual performance is to tilt the rails toward the center of the track. This brings the tread of the wheel in contact with the top center or ball of the rail head instead of making contact near the gage line. This gives greater life to the rail and preserves the gage of the track longer than under the more usual practice. It also transmits the load through the axis of the rail and eliminates the wedging action that a car causes in passing over the rails, thus preventing the opening of a line clearage between the rail and paving. This practice is possible on wooden ties by using a tilted or tapered tie plate, or it can be done by adzing. On steel ties it is accomplished by bending or canting the ends in proportion to the angle of the wheel tread.

It has often been argued that the flexible type of track construction is not as noisy as the rigid type. This is often the case when the single-truck one-man car is used. Using the double-truck, standard built car on new track, there is no difference. But after a few years the rigid track structure is not nearly so noisy as the flexible type because it does not depreciate so quickly. In the case of the single-truck one-man car, this noise is due to the car and not the track. However, these cars need only slight modifications to overcome the trouble.

### WEIGHT OF OPINION BEHIND STANDARDS WILL DETER USE OF OTHER CONSTRUCTION

The American Electric Railway Association is developing standards of track construction by means of practical experiment and scientific research. The technique of this subject is progressing rapidly. In time the type of construction may be standardized with the necessary qualifications for traffic, materials, soils and climatic conditions. With the A.E.R.A. establishing these principles, no municipality will be able to require a railway to install a type of construction under conditions which will entail a heavy loss and be contrary to approved practice. These standards will no doubt be established in accordance with the economic conditions, the capital expenditures to be based on the kind and volume of traffic on the particular line. On main arteries the best construction is the cheapest, while on lines in outlying districts, under normal speed and light traffic, a structure costing one-third less may meet all the demands made of it with an economic return on the capital investment.

Every company should standardize its track construction to conform to the recommended standard of the association, as applied to two or three different types, depending on the traffic demands and with such modifications as may be required for the particular locality. What an ideal situation this would present in the purchase and delivery of track materials, speeding up the work and reducing the costs. Steel mills could afford to carry in stock large quantities of the standard rail sections, ready for quick delivery. Spike manufacturers would need to carry only a couple standard makes. Manufacturers would not have to carry in stock a great number of rolls, dies, special machinery and equipment to meet the various demands of different companies over the country. This has been the cause of the increased cost of the materials purchased and the delay in supplying them. It would mean much to the manufacturer if he could produce this stock in off seasons to meet the demands of the construction season.

The speeding up of the work is an important factor to a number of the railways which are greatly handicapped in starting their construction work by having to wait the decision of some particular municipality before determining a paving program. This may then necessitate the company working late in the fall and using expensive methods for protection against the elements. The effort to keep work going the year around and the expense involved in shutting down work and picking it up again have been discussed considerably recently. More is being done each winter in the building trades to keep work going throughout the entire year, but this will hardly become entirely feasible with street railways in a northern climate. However, if something can be done to keep the manufacturers of track material on a yearly basis the industry will eventually derive considerable benefit.

It was the usual practice for the special trackwork manufacturers throughout the country to be extremely slack for want of work during the winter season until the early spring, and from that time on to be pushed to their utmost capacity. This winter, however, there has been a decided exception to the rule, due to the returning prosperity of the industry and the foresight of the engineers in telling their needs well ahead of their immediate requirements. This means a better class of work, full-time work throughout the year for the men in the industry, and a trend in the right direction toward the continuing prosperity of the country.

## Los Angeles Starts Use of Double-Deck Fageol Buses

THE Los Angeles Motor Bus Company, subsidiary of the Los Angeles Railway Corporation and the Pacific Electric Railway, has ordered 20 new Fageol buses of a double-deck design, and the Los Angeles Railway has purchased five additional for its exclusive use. These constitute a trial installation to prove or disprove their adaptability to render efficient service under Los Angeles conditions. The bus company operates these new buses on the Vermont Avenue and Sunset Boulevard line. They were purchased at a cost of $12,250 each.

Among the unusual features is the equipment of these double-deck buses with pneumatic tires on all wheels, of which the railway says that it is an obvious improvement if it is found to be capable of sustaining the tremendous load to which the tires are subjected. Another feature is that the upper deck is some 3 ft. lower than the two double-deck buses used by the Los Angeles Motor Bus Company heretofore. Nevertheless, the headroom in the lower deck is 74½ in. along the central aisle and 64 in. over the seats. The upper deck seating consists of two longitudinal seats in the center of the bus placed back to back, and two cross-seats at the front end. The total seating capacity is 58, with 26 seats inside and 32 on the upper deck. The total weight is 13,200 lb., of which 5,600 lb. is on the front axle and 7,600 lb. on the rear. This gives a weight per seat, light, of 227.6 lb.

The over-all height of the vehicle is 10 ft. 1 in. The lower floor is 22½ in. above the ground, and the upper floor is 7 ft. 2½ in. from the ground.

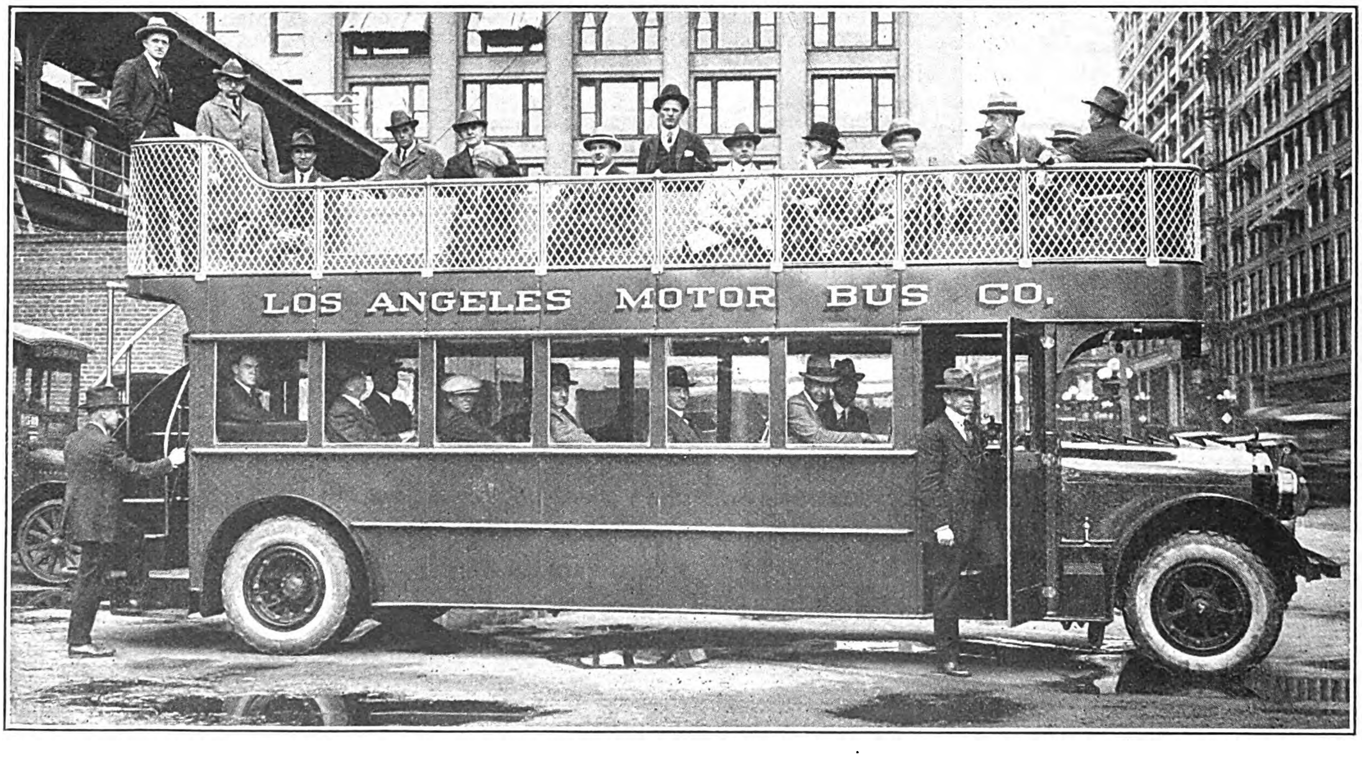
The bus is designed for one-man or two-man operation, there being both front and rear doors. For one-man operation the door at the rear is closed and the upper deck not used. For two-man operation, of course, entrance to both lower and upper deck are made by way of the rear platform and the front door serves as an extra exit, it being operated by the driver.

The bus is equipped with a 100-hp. six-cylinder motor, which makes possible a speed of 33 m.p.h., with a full load. It is said to have an unusually fast acceleration.

## Gold Bars Awarded for Five Years of Service

AN UNUSUAL form of service insignia for trainmen and inspectors has been adopted by the Union Street Railway, New Bedford, Mass. Instead of the familiar gold or silver diagonal stripe on the coat sleeve, which was the former method of indicating that a man had been five years in the railway service, a vertical gold bar, ¾ in. long and ¼ in. wide, is now sewed on the bottom of the sleeve. When a man wears several such bars an impressive effect is created. The change from the older designation to this form was made at the request of the men themselves, who borrowed the idea from the local police and fire departments.

A Gold Bar Sewed Vertically Near Bottom of Coat Sleeve Is Five-Year Service Insignia in New Bedford, Mass.



Twenty-five of These New Double-Deck Fageol Buses Will Shortly Be in Use in Los Angeles, Cal.

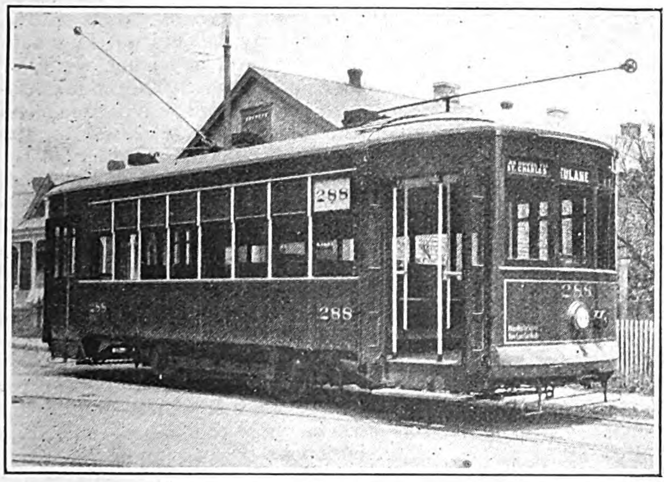
# A Single-Truck One-Man Two-Man Car

**Experimental Car Built by New Orleans Public Service, Inc., Is Designed Primarily for Economical Operation, but Is so Constructed that Moderately Heavy Traffic Can Be Handled**

TO PROVIDE more frequent service on lines where the riding is light during most of the day but comparatively heavy during the rush hour, the New Orleans Public Service, Inc., has built at its Carrolton shop a single-truck one-man two-man car. During the slack periods it is planned to operate cars of this type on a 15-minute headway with one man, replacing the present 30-minute service provided by double-truck two-man cars. In rush hours, however, the new cars can be operated by two men if this is found necessary.

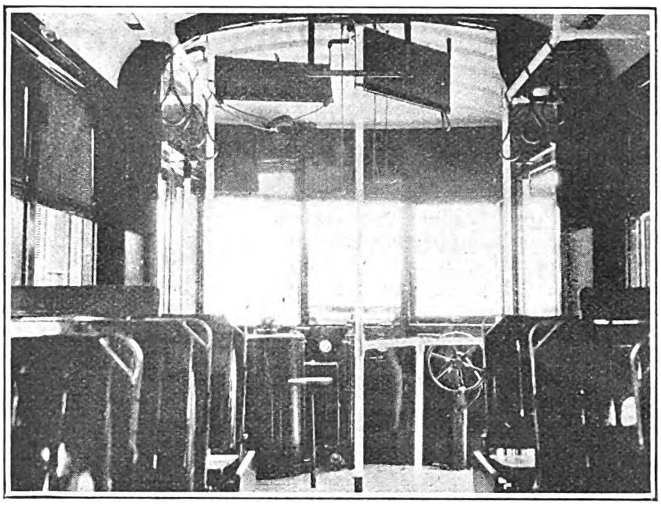
Novel features of this experimental car are the arrangement of doors and location of the stanchions. The cars are double-ended, and four sets of double folding doors are provided. The front right-hand doors are operated by National Pneumatic engines controlled by the motorman's brake handle in accordance with standard safety-car practice. The right hand rear doors are manually operated. The doorway at the motorman's right is divided in the middle by a vertical stanchion running from floor to roof. A similar stanchion behind the operator divides the aisle at the bulkhead line. Between these two in the middle of the entrance, but some distance back from the step, is a third stanchion. This one, however, is only waist high and is connected by a horizontal rail to the other two. When the car is run by one man, passengers enter through the forward half of the double doors and pass close by the operator, paying their fares as they enter. Passengers leave the car by the rear section of the double doors, passing on the other side of the railing.

When the car is operated by two men, however, the conductor sits at the left of the railing on the rear platform and passengers enter through the manually operated doors on the right side of the car. The lever controlling these doors is on the center post. In this case, the stool which is shown in the accompanying illustration can be placed behind the railing for the conductor's use. As hand collection of fares is established practice in New Orleans, no provision has been made for a fare box. The car, however, is equipped with an International hand-operated register.



Car Built by New Orleans Public Service, Inc., as an Experiment to Determine Applicability to One-Man Operation

Besides making possible the operation of this car by one man or two men, as may be desired, the plan of having doors on both sides at both ends permits operation on either the inside or outside tracks in the neutral ground on Canal Street. On the inside tracks on that street passengers board and leave the cars on the left-hand side.



Novel Arrangement of Doors and Stanchions Serves a Double Purpose

The seating capacity is 32, which is provided by six cross seats on each side and a 2-passenger seat on each side at each end. Hale & Kilburn wood slat seats are used.

The car body is built of steel with wood-filled T-posts. White Agasote headlining is used beneath an arch roof. Ventilation is secured by means of six Utility ventilators. The truck is of the Brill 79-EX2 type and carries two Westinghouse No. 514 motors. The total weight is 29,000 lb.

Other equipment on this car includes two O-B trolley bases, headlights and trolley catchers; More Jones 6-in. trolley wheels, a Faraday car signal system, Pantasote curtains, Keystone signs, H-B lifeguards, Peacock hand brakes, G. E. type CP-27 air compressor, and an aluminum cell lightning arrester.

If this experimental car proves successful and the company wants more cars of this type it is planned to purchase them outside rather than to build them in the railway shops.

# Personal Appearance Emphasized in Atlanta

NEAR the door leading from the trainmen's room in the downtown dispatchers' station to the street the Georgia Railway & Power Company, Atlanta, Ga., has placed a full-length mirror, above which is a sign reading:

> "Before you go out to tell people you represent this company, look yourself over to see if you do."

Similar mirrors and signs have been placed in the various carhouses.

# Association News & Discussions

## Reducing Claims Expense Through Good Public Relations[*]

BY W. T. BIE
Attorney Wisconsin Public Service Corporation, Green Bay, Wis.

CLAIMS obviously are closely linked with operation and service. To avoid paying out a substantial portion of the gross income for claims two things must be uppermost in the mind of the operating head: (1) To avoid accidents, (2) to give such service that public sentiment will be with the company rather than against it.

At the convention two years ago C. E. Warwick of our company read a paper on the prevention of claims,[†] going into detail on the bonus system formulated and put into practice by him. Undoubtedly the preventive methods adopted by him are the principal reasons for the claim record made in Green Bay in 1923.

The other essential necessary to save money on claims is to give such service that public sentiment will be with the company rather than against it. Previous to 1912, when the Wisconsin Public Service Corporation took over the Green Bay property, the traction company had been made a football in every local political fight for years. A number of lawyers availed themselves of every opportunity to damn the street car company, and opportunities were frequent. As a result the street car company did not dare to go into court on any case involving a jury question, for such questions were resolved into verdicts for the plaintiff.

My association with the Wisconsin Public Service Corporation dates from the fall of 1913, shortly after it took over the Green Bay property. At that time several suits were pending against the company for damages aggregating $150,000. These cases were all settled without trial by paying out considerable money.

From that time on every accident, no matter how trivial, was reported and carefully investigated. The company, in its advertisements and in its general dealings with the public, pursued a policy calculated to educate the public to a belief that the company was operating to serve the public. No opportunity was lost to emphasize that fact.

### INVESTIGATED BY PERSONAL LETTERS

In the investigation of claims a carefully worded letter is written, with a questionnaire inclosed, for the answers of the witness. The letter has a personal tone. It is signed by an individual without any title appended. It deals with men rather than a street car company. It puts the issue squarely up to the witness: Was the man handling the auto to blame, or the man handling the street car? When the witness sits down to answer his questionnaire with the issue of men in his mind, he is pretty sure to be fair in his answers.

Every questionnaire received is acknowledged by a second courteous and personal letter. Even if the witness answers only one question, and answers "I don't know" to all the others, a letter of thanks acknowledges receipt of the questionnaire. In the past ten years the names of 4,415 witnesses have been reported in accidents. It is safe to say that 4,000 of them received two letters each. Four thousand opportunities to get acquainted with a car rider, and to make a friend of that car-rider, were taken advantage of. These letters were not signed with a rubber stamp, nor were any carbon copies used. They were personal letters. A special effort was always made to get the correct spelling of the name from the city directory. If the name was misspelled in the first letter, the second letter was addressed exactly as signed to the questionnaire by the witness.

### COSTS GRADUALLY REDUCED

The progress that the company has made in reducing accident payments is shown in an accompanying table.

SUMMARY OF ACCIDENT PAYMENTS BY YEARS, WISCONSIN PUBLIC SERVICE CORPORATION

| Year | Total Settlements | Per Cent of Gross | Lawsuits |
|---|---|---|---|
| 1914 | $3,177 | 2 | 0 |
| 1915 | 4,870 | 3 | 2 |
| 1916 | 3,847 | 2.3 | 0 |
| 1917 | 1,467 | 1 | 1 |
| 1918 | 1,007 | 0.5 | 0 |
| 1919 | 4,604 | 2 | 1 |
| 1920 | 2,096 | 0.7 | 4 |
| 1921 | 1,432 | 0.5 | 0 |
| 1922 | 959 | 0.4 | 3 |
| 1923 | 371 | 0.1 | 3 |

In 1916 two important steps were taken to prevent accidents: The open platform was abolished on all city cars and the near-side stop was adopted. In 1917 the results of the campaign to avoid accidents and to make friends became more noticeable. In 1919 discipline suffered on account of high war wages and we had several bad accidents for which we were to blame. Our entire organization had been weakened by the absence of several employees, officials and attorneys in the army and navy. In 1920 conditions improved. We had no bad accidents and successfully defended four suits. Our gross income reached its peak this year, due to booming industries and a high rate of fare.

In the fall of 1921 Mr. Warwick put his bonus system into practice and the result was noticeable at once. It kept every operator's mind alert at all times to avoid accidents; it made operators desirous of getting favorable reports from passengers, and therefore more courteous and obliging to passengers at all times. It gave them more of a personal interest in their work.

About the same time the company built an extension on Shawano Avenue and put in better and more frequent service on all lines. New Birney cars, operated by one man, replaced the old cars. People began talking about the good car service the city had. The good spirit of the operators, as well as their desire to give good service, permeated the cars and the entire city.

About this time an issue of the company's preferred stock was offered for sale to the general public, the employees acting as stock salesmen. The campaign slogan was "Be a Partner." Any one who wished could share in the company's profits. The fact that the company was actually serving the public at large was brought home to nearly every one in the city, and the employee salesmen demonstrated the fact that the "company" consisted of ordinary human beings.

All of these matters brought about a decided change in the atmosphere surrounding the street car system. Boosters were more numerous than knockers. We had reached the stage where we could handle claims fairly, settle them justly, but did not fear submitting a case to a jury when we knew we were in the right. The bonus system was pretty well advertised, and when the motorman appeared at the attorneys' table in court the jury understood that to a certain extent, at least, it was his battle as well as the company's. Our gross income in 1922 dropped about 10 per cent lower than the previous year. Business had slumped and the high rate of fare was unpopular. We had 179 accidents in 1922, the greatest number in the history of the company. The bonus system could not counteract the great increase in the number of automobiles on the streets, but the most noticeable effect of it was that the motorman had such control of his car that only minor accidents happened in cases where, with less perfect control, serious injury or death might have resulted. We tried three cases, getting jury verdicts in all of them.

In the winter of 1922-23 the city commission passed an arterial highway ordinance, with arterials on several streets traversed by the car tracks. This was a great move for safety. The number of accidents in 1923 decreased to 162, notwithstanding increased automobile traffic. The rate of fare was decreased approximately 10 per cent, but the gross income for 1923 showed an increase of 15 per cent over 1922, in spite of the decreased fare, and the number of passengers carried showed an increase of 25 per cent. From a gross income of $163,000 in 1916, it rose to $279,000 in 1923, an increase of 72 per cent in seven years. The first three months of 1924 show a big increase over the same period in 1923.

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[*] Abstract of a paper before the Electric Railway Section, Wisconsin Utilities Association, Milwaukee, April 17-18, 1924.

[†] Abstracted in ELECTRIC RAILWAY JOURNAL, Aug. 26, 1922, page 301.

### Receipts Exceed Expenditures

Accidents on which claims were made in 1923 may be summarized as follows:

MONTHLY SUMMARY OF ACCIDENTS AND DAMAGES, 1923, WISCONSIN PUBLIC SERVICE CORPORATION

| Month | Number of Accidents | Paid for Damage to Property | Paid for Personal Injury | Collected for Damages to Street Car |
|---|---|---|---|---|
| January | 19 | 0 | 0 | $57 |
| February | 9 | 0 | 0 | 103 |
| March | 19 | $43 | 0 | 0 |
| April | 10 | 12 | 0 | 0 |
| May | 5 | 4 | 0 | 0 |
| June | 15 | 0 | 0 | 9 |
| July | 19 | 8 | 0 | 40 |
| August | 13 | 11 | 0 | 0 |
| September | 11 | 0 | 0 | 0 |
| October | 15 | 5 | 0 | 73 |
| November | 16 | 188 | 0 | 60 |
| December | 11 | 0 | $100 | 47 |
| | 162 | $271 | $100 | $389 |
| Total paid out for accidents............. | | | | $371 |
| Excess collected..................... | | | | $18 |

Disregarding what we collected for our damages in accidents, we paid out one-tenth of 1 per cent of our gross income for claims in 1923.

### The Car Operator Is the Company's Salesman

I have tried to emphasize the importance of public relations in the handling of claims. Constant efforts must be made to make friends. The car operator is the one man more than any other who represents the company in the eyes of the public. He must be courteous and efficient. Safety and efficiency go hand in hand. It is useless to talk "safety" when efficiency is below par. When cars are late or overcrowded safety is necessarily jeopardized, and the operator struggles along as best he can. Accidents for which the company is held to be at fault may be usually traced to a failure in efficiency rather than to a failure in safety practices. It is culpable negligence for a company to fail to give adequate service. Even though an operator by extraordinary diligence is able to avoid accidents where service is not adequate, when the traveling public is dissatisfied with the service, passengers called as witnesses or jurors will be unfriendly.

### Good Service a Good Investment

Service must be not only adequate, but the company in its service should keep one step ahead of the demands of the public. This is particularly true when the company has power, light and gas departments in addition to the railway department. In such cases the railway department is the good-will developer, not only for itself but for the other departments as well.

A public utility company that fails today to utilize its street railway as a good-will developer is twenty years behind the times. A little money invested in giving good street car service will buy more good will than any amount of advertising. It is an operating crime to keep passengers waiting on the streets in cold weather for cars that are off schedule and then to make them fight their way in and out of overcrowded or cold cars. One day of such service will cause a loss of all the good will built up by a year of good service. On the contrary, service that will take the passenger home satisfied, and with a kindly feeling because the company took him home quickly and comfortably in cold weather, will go a long way toward avoiding complaints on high gas and light bills.

The street railway in Green Bay carried more passengers in the past winter than ever before in its history. Undoubtedly other street railways properly operated had the same experience. Automobile owners are learning that the best winter substitute for gasoline is the street car ticket. This business must be held, and the only way it can be held is by increasing track facilities and equipment so as to keep one step ahead of the actual needs. Keep the public satisfied by efficient service and the handling of claims will be an easy matter.

### Claim Department Can Help

The claim department itself can do much to better public relations. We never decline a claim as soon as it is made. Every claimant is treated courteously and is convinced that his claim, no matter how meritless, will be given serious consideration.

When an auto accident happens we instruct the claimant to treat the matter as his own, and after his auto is repaired to bring in his repair bill. By that time we will have had the accident investigated, and if we are in any way to blame for it we will take care of his bill. If we find his claim to be without merit, we so inform him by a courteous letter stating the reasons why. He may come back a second time, and frequently we then show him the signed statements of disinterested witnesses who blame him for the accident. We tell him that we cannot pay a meritless claim for two reasons: (1) because we have no right to spend money without reason because it affects the rate of fare, and (2) because by paying a claim we admit that our operator was to blame and he loses his bonus.

Absolute fairness with a claimant is imperative. I have never tried to dispose of a claim for which we were liable for less than what I thought the damage actually was. In a few cases where an ignorant claimant, or one mistaken as to his rights, was willing to accept less money than I felt he was entitled to, I voluntarily gave him more than he asked. Ordinarily, of course, the claimant demands more than he should have, and then it is necessary to convince him that his demand is exorbitant. I know from various sources that I have made friends in the handling of claims. Frequently a claimant comes to the office saying that he heard that the company would do the right thing, and therefore he came to the company direct rather than to an attorney. Local attorneys often send claimants to see us direct and tell them that we will be fair with them.

To summarize, to cut down the disbursement of the claim department it is necessary:

1. To cut down the number and the seriousness of accidents by proper preventive and safety measures.
2. To make the street railway a subject of complimentary comment rather than the opposite, by giving real service, prompt, ample, safe and efficient.
3. To investigate all claims promptly and carefully.
4. To treat all claimants with absolute fairness and consideration at all times, settling proper claims promptly, fairly and willingly and declining improper claims in a way that will impress upon the claimant the company's necessity for declining them.

## American Welding Society Holds Annual Meeting

A FOUR-DAY meeting of the American Welding Society was held in the United Engineering Societies Building, New York, N. Y., April 23-26. The technical session of the society, held Friday, consisted of a symposium on the subject "Flexibility vs. Rigidity in the Design of Welds." Short talks were made by exponents of the different types of welding, to show whether a weld should be made more rigid or flexible than the part which it joins. J. C. Lincoln, vice-president Lincoln Electric Company, spoke on the design of welds when made by the carbon arc process. His conclusion was that if the right speed of welding is used the expansion of metal in plates ahead of the weld, which tends to draw the plates together in cooling, and the expansion of the edges of the plates, which tends to open them up at the finished end, can be made to balance each other and thereby eliminate warping.

Flexibility and rigidity as resulting from gas welding was discussed by S. W. Miller, research engineer Union Carbide & Carbon Research Laboratories. He laid emphasis on the importance of making a weld with the same physical properties as those of the base metal. C. J. Holslag, chief engineer Electric Arc Cutting & Welding Company, discussed the design of welds when made by the metal arc process. He said that a weld will always be a casting unless some method of forging is used and that progress in the art would be more rapid if the basic principles and limitations are frankly taken into account. Resistance welding was discussed by H. A. Woofter, electrical engineer Thomson Electric Welding Company. J. H. Deppeler, chief engineer Metal & Thermit Corporation, discussed the subject from the thermit welding standpoint.

Reports of the officers and various committees of the society were presented at the business meeting Thursday, and the following officers were elected for the ensuing year: President, E. H. Ewertz, the Bethlehem Shipbuilding Corporation; vice-presidents, T. A. Wry, for New York and New England; J. D. Conway, for the Middle Eastern Division, and H. S. Mann, for the Middle Western Division. The directors at large elected were J. H. Deppeler, A. S. Kinsey, W. A. Slack and E. M. T. Ryder, Third Avenue Railway, New York.

## Fire Protection for Carhouses and Cars

THE committee on electric railway carhouses and cars of the National Fire Protection Association has prepared a comprehensive report covering tentative regulations for electric cars and locomotives; wiring of electric carhouses and auxiliary buildings operated by electric traction companies; and construction, maintenance and protection of carhouses.

This is the first report of the committee, which was formed in 1923 and which consists of A. M. Schoen, chairman; H. H. Adams, W. S. Boyd, N. E. Drexler, J. C. Forsyth, Louis Harding, J. S. Mahan and J. T. Staub.

The regulations presented in the report for tentative adoption are intended to replace the sections on car wiring and equipment of cars and carhouses which appeared in the National Electrical Code, edition of 1920; the section on railway carhouses in the regulations on sprinkler equipments, edition of 1922, and also to supersede the rules and requirements for the construction and protection of standard railway car storage and operating houses, edition of 1907.

Advance copies of the report for the purpose of preparing discussion and criticisms may be obtained by addressing the National Fire Protection Association, 40 Central Street, Boston, Mass.

## U. S. Chamber of Commerce Meets in Cleveland

AT THE twelfth annual meeting of the Chamber of Commerce of the United States, held in Cleveland, May 6 to 8, two men prominent in public utilities were elected to the board of directors. These were John W. Shartel of Oklahoma City and Lafayette Hanchett of Salt Lake City, Utah. In the case of Mr. Shartel, this was a reelection. Two other utility men remain on the board from last year, namely, P. H. Gadsden of Philadelphia and Paul Shoup of San Francisco.

The attendance at the convention was large, and the American Electric Railway Association was represented by a considerable number of the delegates and alternates appointed to attend. As the association's executive committee met in Cleveland on May 7, many other railway men were able also to be in attendance.

The subjects taken up by the National Chamber of Commerce this year did not include any relating primarily to electric railways, the principal subjects being: business and agriculture, European readjustment, and the responsibility and integrity of business. The report of the directors of the national chamber, however, referred at considerable length to the work during the last year of the transportation committee, whose reports, so far as they have related to electric railways, have been published in these columns.

There was also a report of the results on the conclusions of this committee, as contained in Referendum No. 43, submitted to the members. This referendum was based on the report of the transportation committee, and contained fourteen recommendations. The vote on each was in the affirmative by the two-thirds majority required. Of these fourteen recommendations the last three related in part to electric railway or bus service. They follow with the vote recorded:

12. The committee recommends that wherever experience indicates that it will be in the public interest, regulatory bodies should facilitate the utilization of motor transport to replace uneconomical forms of rail service, to relieve yard and terminal congestion, and to extend existing steam and electric railway services. In favor, 1,608½; opposed, 322½.

13. The committee recommends that the rates and services of motor common carriers, both freight and passenger, should be subject to regulation by the state and federal commissions which have jurisdiction over the operation of other common carriers, having particularly in view insuring to the public adequate, economical and continuous service. In favor, 1,765½; opposed, 200½.

14. The committee recommends that in addition to bearing an equitable share of the general tax burden, the road users should pay the entire cost of maintenance of improved highways through special taxes levied against them, such special taxes being applied exclusively to that purpose. In favor, 1,283½; opposed, 436½.

This vote was concluded May 6. There are 1,002 organizations eligible to vote and the total voting strength is 3,270; thus the vote recorded was about 60 per cent of the total voting strength.

The directors also called particular attention to recommendations in the transportation report on greater coordination of transportation agencies and the need for simplification of taxation of steam and electric railways.

A feature of the Cleveland meeting was a series of addresses on standards of business conduct. The first was Wednesday evening by Secretary Hoover, who saw in associations an agency through which high standards in business conduct could be established and enforced. On Thursday morning Judge Edwin B. Parker, chairman of the committee on business ethics of the chamber, presented a concrete code.

# I.C.C. Order on Section 15a

### Interurbans to Be Required to Supply Information to Enable Commerce Commission to Make Individual Determination as to Application of Law

IN FINANCE DOCUMENT No. 3392 the Interstate Commerce Commission has made its report and order on the application to electric railways of Section 15a of the interstate commerce act. The report refers to the hearing* given electric railway officials before the commission on March 19, summarizes the evidence placed before the commission on that occasion which drew the distinction between interurban lines and steam railroads. The report states that, "Considering the responsibility as well as the benefits of carriers under Section 15a, it seems clear that Congress intended to exclude interurban electric railways generally from its operation, and to include them only when engaged in such transportation of freight as would cause them to resemble steam roads in the performance of that function."

The commission then goes on to say:

"There are many electric roads which closely resemble the steam roads in some particulars of freight transportation, and are not greatly dissimilar in others, whose status under section 15a is involved in considerable doubt. From the nature of the problem it is obvious that no hard and fast rules can be laid down upon which reliance can be placed in classifying the carriers. Each road must be considered by itself. In determining whether a particular carrier is 'engaged in the general transportation of freight' within the meaning of the statute, as we have construed it, consideration may properly be given to relative amounts of freight and passenger traffic, connections with steam roads and business performed over such connections, amount and manner of handling through and interstate traffic, amount of equipment interchangeable with steam roads, character of right-of-way, territory served, and handicaps under which the carrier labors in handling freight, such as those arising from municipal regulations, curvature and kind of track, station facilities and characteristics of equipment.

"No attempt was made at the hearing to establish a record upon which the status of any particular carrier could be determined. All that can be done upon this record is to arrive at the general principles of classification which will effectuate the purpose of the legislation. It is obvious that the operations of electric roads and their relations with steam roads will change from year to year, perhaps bringing an additional number within the scope of the section, and exempting others. It is necessary to effect a classification covering operations of such lines for the years since the act became effective, as well as for the future. To meet this situation, all electric railway operating companies will be served with the general orders issued from year to year under section 15a, requiring reports of value and of railway operating income. They will also be required to respond to a questionnaire calling for information upon matters deemed controlling in determining the status of electric lines. This information will be required of all electric lines subject to the act, but those which claim exemption from the provisions of section 15a may so state, omitting for the time being data with respect to values and income required by the regular order. Such further proceedings will be had as may be found necessary in dealing with individual companies."

The questionnaire referred to in the commissioner's report comprises the following:

"It is ordered that each electric railway operating company subject to the interstate commerce act be, and it is hereby, required to make, under oath, full and true answers to the following questions:

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*Covered in some detail in ELECTRIC RAILWAY JOURNAL for March 29, page 511.

"1. What was the amount of respondent's freight revenue, passenger revenue, and total transportation revenue for each of the years 1920, 1921, 1922, and 1923?

"2. With what railroads (stating whether steam or electric), and at what points does respondent have track connections?

"3. Does the respondent have joint freight tariffs and through freight rates with any other road or roads? If so, state names of such roads and whether steam or electric.

"4. What is the character of respondent's freight business, the principal commodities handled, and the percentage of freight tonnage, if any, handled in carloads?

"5. Approximately what percentage of the freight revenue of respondent is derived from interstate traffic?

"6. How many freight cars are operated by respondent and what is their character? To what extent are they interchanged with steam roads?

"7. Does respondent receive from and deliver to connections standard steam railway equipment, and, if so, to what extent?

"8. To what extent is respondent's freight service interfered with by municipal regulations or characteristics of road, track or equipment?

"9. What percentage of respondent's road is on public streets and what percentage on private right of way?

"10. To what extent and how closely is respondent's road paralleled by steam roads?

"11. What material changes, if any, have taken place in any of the particulars covered by questions 2 to 10, inclusive, since March 1, 1920?

"12. Does respondent claim exemption from the provisions of section 15a of the interstate commerce act?

"It is further ordered, that answers to the foregoing questions shall be submitted in typewriting, numbered to correspond with the questions, and on paper approximately 8x10½ in. The name of respondent shall appear at the top of the first sheet. The original response, verified by oath, and three copies thereof, shall be forwarded to the commission on or before June 1, 1924, addressed to George B. McGinty, its secretary, Washington, D. C."

## City Transportation Requirements

IN AN address on metropolitan planning for future transportation requirements, given at the Philadelphia Engineers' Club on April 15, J. Rowland Bibbins of Washington declared that every large city should plan ahead for its transportation requirements on the basis of double its present population. This is because of the present rapid drift of the population to cities. In 1880, 27 per cent of the population of the country dwelt in towns and cities, whereas in 1920 more than 50 per cent did so. Within the last 10 years many of the larger cities have had increases of 25 per cent or more in population. This growth is accompanied by striking changes in character of districts within each city.

Theoretically, the increase in population should also be accompanied by a still greater increase in transportation facilities, but as a rule the physical facilities for transportation, like streets, highways, trackage, storage for peak transportation and even carrier equipment have barely increased in arithmetic ratio to the population, if at all. By 1940 a population of at least 130,000,000 may be expected in this country. This means from 65,000,000 to 70,000,000 people in the cities, or more than the number in the entire United States between 1890 and 1900.

These people can be transported only if all means for transportation are coordinated. The time for superficial expedient measures has passed.

The problem of financing transportation improvements is one largely of rush peak capacity. All interests in a community should be enlisted to prepare and support a plan for development. The transportation plan should be based on the assumption that the American public will finally support the best service it can secure. Technical study is required on a number of research problems. Among them may be mentioned: Development of traffic signals; segregation of various kinds of city traffic; determination of parking time; introduction of the express idea in traffic routing with increases of 10 to 20 per cent in street car schedule speed and means for bodily transfer between express lines and feeders; means for roadway widening; night delivery and collection of central-district freight to relieve the streets in the daytime, etc. In Mr. Bibbins' opinion, transportation is the key to the future in metropolitan planning.

## Central Traffic Association

THE next regular meeting of the Central Electric Traffic Association will be held at Hotel Tuller, Detroit, Mich., May 21 and 22.

## Heavy Traction at A.S.M.E.

THE railroad division of the American Society of Mechanical Engineers, which will hold its spring meeting in Cleveland, May 25 to 29, will have as the topic of discussion "Recent Developments in Heavy Electric Locomotives." Two papers will be presented on this topic, one by N. W. Storer, Westinghouse Electric & Manufacturing Company; the other by W. B. Potter, General Electric Company.

## Iowa Convention June 27

THE annual convention of the Iowa Electric Railway Association will be held at Fort Dodge on June 27, it is announced by President F. C. Chambers. The meeting will be held immediately following that of the Iowa Section of the N. E. L. A. at Fort Dodge on June 24-26, as many of the men are interested in both associations.

## New York Traffic Problems to Be Discussed

FOR the purpose of discussing traffic problems of the New York metropolitan area and its immediate environs, totaling some 5,528 sq.mi., a conference has been called for May 20, to be held at the Town Hall, 121 West Forty-third Street, New York City, beginning at 10:30 a.m. This meeting is sponsored by fourteen civic bodies, including chambers of commerce, merchants' associations and boards of trade. It will be in charge of the Committee on the Regional Plan of New York and Its Environs. M. R. Boylan, George Keegan and C. E. Morgan will attend as delegates for the local railways.

In connection with the conference, there will be held from May 19 to 24, in the halls of the Russell Sage Foundation, an exhibit of maps and drawings showing how traffic and street layout problems are being handled in the various communities.

# American Association News

## Midyear Meeting Pays Its Way

W. H. SAWYER, general chairman of the committee on general arrangements for the St. Louis Midyear Meeting March 4 last, has made his final report to the executive committee. The revenue consisted of the sale of 756 tickets at $10 each, or $7,560. Total expenditures amounted to $7,503.75, leaving a credit of $56.25 above expenses. In reporting to the executive committee Mr. Sawyer commented that it was his understanding that this was the first Midyear at which the revenue exceeded the expense.

## Special Reports Available

THE following reports have been prepared by the American Electric Railway Association and are available to member companies in good standing upon request:

*Electric Railway Operations in* 1923: Gives comparison of revenues, operating expenses, net revenues and passenger traffic of 406 companies for 1923 and 1922. It also gives for 288 companies complete comparative income statement, operating expenses by primary accounts; the same statements again on a per car mile basis; operating and traffic statistics and ratios; and unit figures derived from them. The 288 companies are classified into city and interurban companies and companies operating both city and interurban lines and each of these groups is further subdivided into three smaller groups according to the size of the company.

*Automobile Operating Costs:* Cost figures of passenger automobiles, divided between operating and nonoperating costs, have been collected from all sections of the country and are presented in detail in this compilation. Comparable figures for a large number of Ford, Dodge and Buick cars have been obtained and general average figures for these makes of cars have been worked out.

*Special Factors Affecting the Working Conditions of Electric Railway Trainmen:* Contains information covering a number of miscellaneous conditions such as the establishment of pension systems, allowances of time off periodically, contributions to cost of uniforms, awarding of service stripes, free transportation for men and families, bonding of conductors, etc.

In addition to the above, supplements to the Fare Bulletin, Wage Bulletin and Cost of Living Studies have been prepared, bringing them up to date.

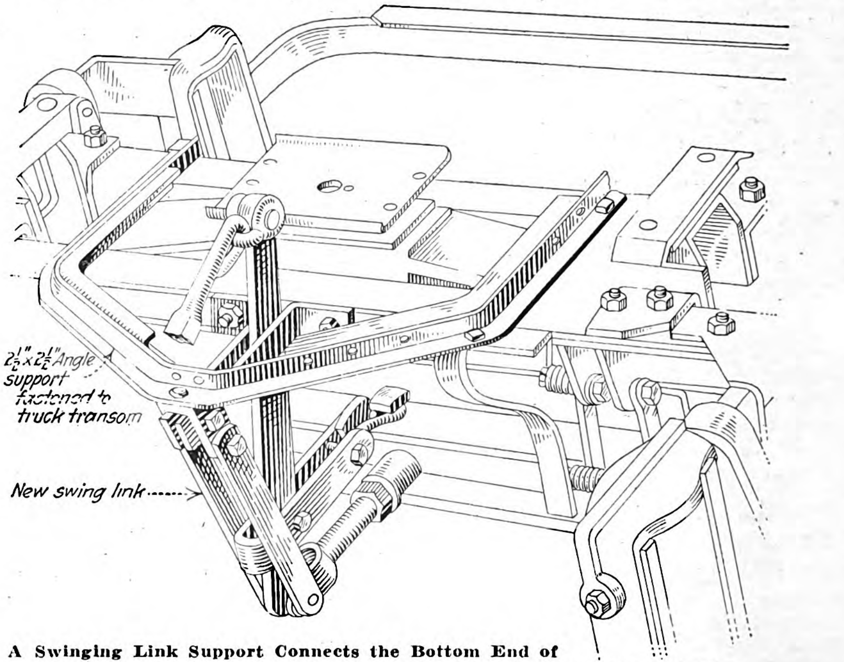
# Maintenance of Equipment

## Link Support for Truck Live Lever

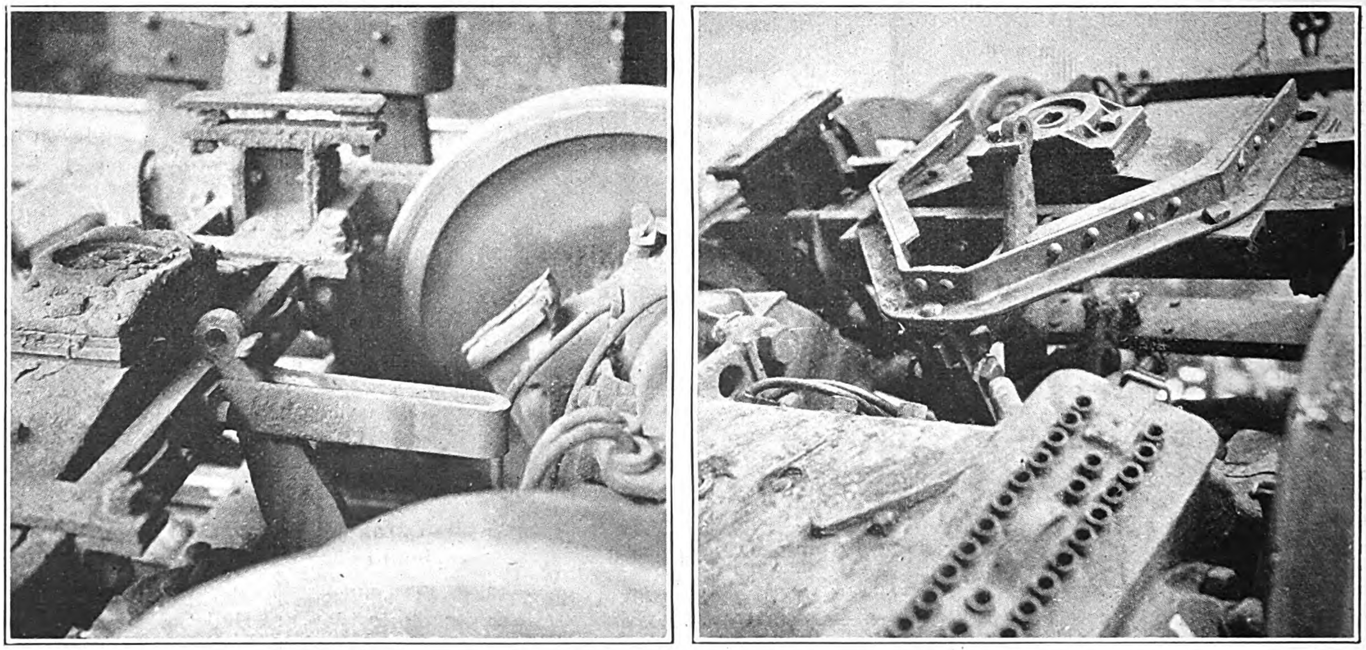
ON THE Brill 39-E trucks used on the Third Avenue Railway, New York City, the pony brake beam is located underneath the driver brake beam at the truck bolster. The fulcrum of the truck live lever is connected to the driver brake beam through a link, and the lower end of the truck live lever connects to the pony beam through a hand slack adjuster. This type of truck was found particularly suitable for use with the underground conduit contact system in New York, where suspension for the contact plows is provided on the trucks. This takes up considerable space on the trailer ends of trucks, and the brake beam for the pony wheels cannot be located close to the wheels.

The old standard construction of truck brake rigging for the 39-E has the live lever hanging from the body brake rod, with the lower end of the live lever attached to the pony brake beam as just described. With an application of the brakes, the rotation of the pony wheels in one direction tends to tilt the brake beam and pull the live lever down. The Third Avenue Railway Company has experienced difficulty from this tilting of the pony brake beam, which was enough in some cases to allow the end of the live lever to strike the pavement.

To overcome the difficulty a new type of link support has been designed and is being applied to all the trucks of this design operated by the company. Since it is essential that the live lever be free to move, the links have been attached to the hand slack-adjuster clevis at its lower end. These links, which are of 2½-in. x ½-in. bar, are hung at their upper ends from a small bracket in the form of an inverted U. The entire suspension is supported from a frame constructed of a 2½-in. x 2½-in. angle, reinforced on



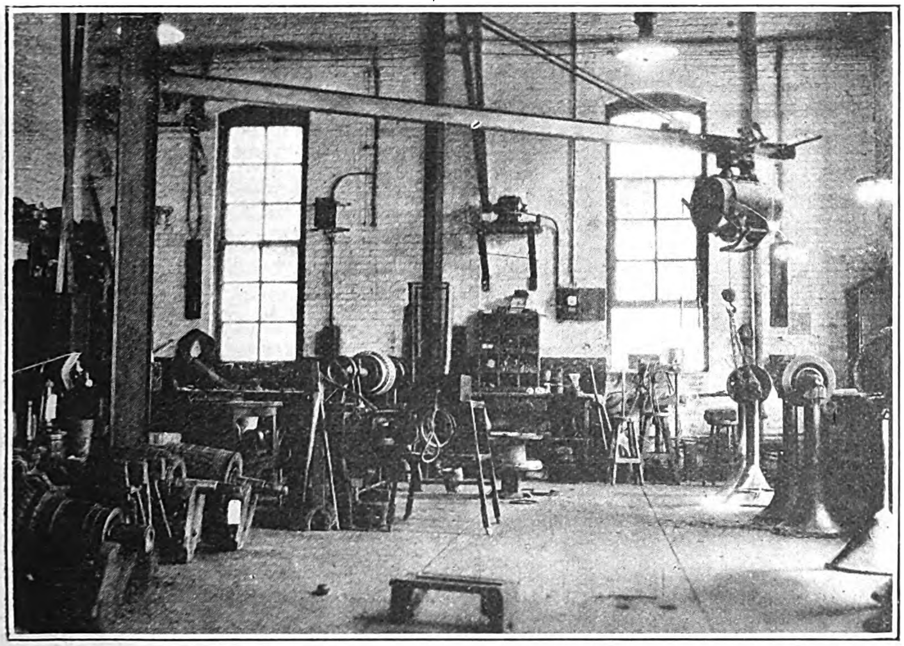
A Swinging Link Support Connects the Bottom End of the Truck Live Lever with a Suspension Frame on the Truck Bolster



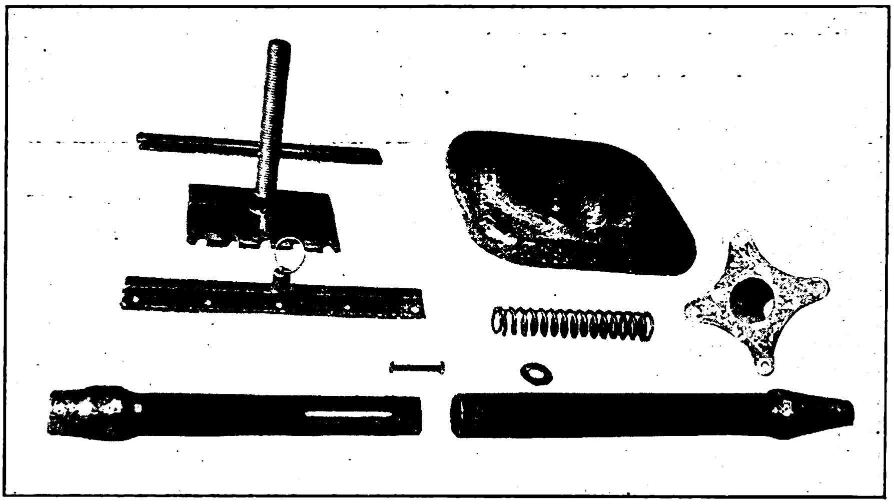
At Left, Original Construction for Truck Brake Rigging on 39-E Truck. At Right, New Suspension Provided for Truck Live Lever the inside by two 1½-in. x 1½-in. angles, the whole being bolted to the truck transom. Further support is given by the live lever guide. The original U-shaped guide is cut open and the outside ends are bolted to the U-shaped bracket which holds the hanger links. The link support eliminates the tilting action of the pony brake beam and prevents the live lever from being lowered out of its normal position. Accompanying illustrations show the old and new types of construction.

## Jib Hoist Serves Whole Armature Room

A SWINGING hoist that serves the entire armature room has recently been installed at the Fulton County plant of the Georgia Railway & Power Company, Atlanta, Ga. The vertical column is a 10-in. I-beam, pivoted so that it will swing through about 180 deg. The horizontal arm, which is a 6-in. I-beam, carries a Sprague ½-ton electric hoist. Practically any point on the floor can be reached. An armature can be picked up from the stand where it has been rewound, swung over to the rolling pans, which are used in place of dipping vats, and from there carried to the baking oven. The electric hoist can be operated from any position along the length of the horizontal beam, there being three trolley wires paralleling the beam and furnishing current to the hoist. Much time and effort have been saved since the installation of this apparatus.



The Hoist Rotates so that Winding Racks, Dipping Pans and Baking Ovens Can Be Reached



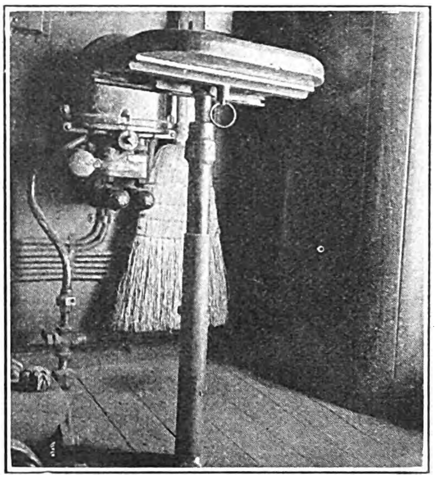
Dismantled Parts of New Nicholls Stool, Which Provides for Up and Down and Forward and Back Adjustment

## Improved Stool Adopted by Denver Lines

By G. Benbrook

THE Denver Tramway Company has recently adopted the Nicholls motorman's stool, designed and patented by Stephen Nicholls, mechanic at the Denver Tramway shops.

This stool has the advantages of being adjustable in height and also in proximity to the operating equipment, and of being solidly and rigidly mounted. The seat and seat post are entirely removable from the vestibule by simply picking up. The post base has a conical end which fits into a base plate installed flush with the vestibule floor. This feature is much appreciated by shopmen who do work on the controller and air brake equipment, as they can readily remove the stool if it interferes with their work.



Double Adjustable Stool on Denver Tramway Car

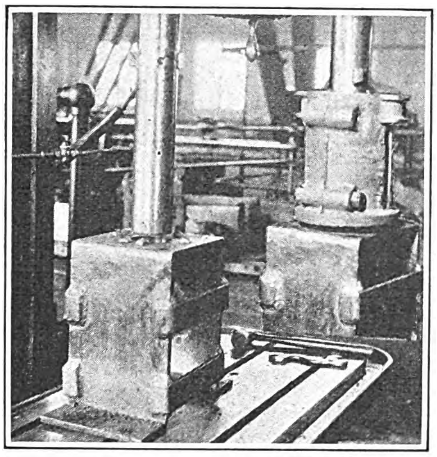
The seat top is fitted on the under side with two grooved plates which slip onto the post top plate. The position of the seat on the post is laterally adjustable. A pull-down spring key engages with notches in the top plate and locks the seat in the position desired relative to the post. A screw and nut provide for height adjustment. These two adjustments are much favored by the operators as they can readily fix the position of the seat to suit their particular statures.

The post of the stool is in two parts. The upper part, into which the top plate screws, fits inside the bottom section and rests on a coil spring. The post is made an integral piece by means of a bolt extending through the two sections. The inner piece is slotted to receive the bolt and to allow for the spring action.

## Boring Axle Collars on Drill Press

IN THE shops of the Pittsburgh Railways a single spindle drill press is used for boring out axle collars on Westinghouse 52 motors. The halves of a collar are fastened together by two opposite bolts and placed on a box-shaped fixture. The top of the fixture has a hole for guiding the boring bar and six pointed set screws for holding and aligning the collar.

The fixture is made up of ½-in. x 10-in. steel in the shape of an inverted "U," braced on the open sides with 1½-in. x ¼-in. steel welded to the frame. The top of the fixture is 15 in. above the base, allowing room for the boring bar to make a complete cut through a collar. The set screws are ⅝ in. x 4 in. with square heads turned up to a point. However, enough of the head is left to provide grip for a wrench. These screwheads serve to hold the collar in position and also permit the collar to be aligned by running the proper screw in or out.



Fixture and Bar for Boring Axle Collars on Drill Press. At Right, Axle Collar in Position for Boring

The centering of the fixture is simple, consisting of running the boring bar into the hole on the top of the fixture and clamping the fixture to the table. The collar is then placed on the pointed set screws with the dust flange acting as a centering guide. The points come just inside this flange.

Adjustments to alignment follow a trial cut with the boring bit. During the boring operation the collar is held to the fixture by means of two small hand screw clamps.

By the use of this method the number of axle collars bored has been increased to eighteen per day from six on an engine lathe.

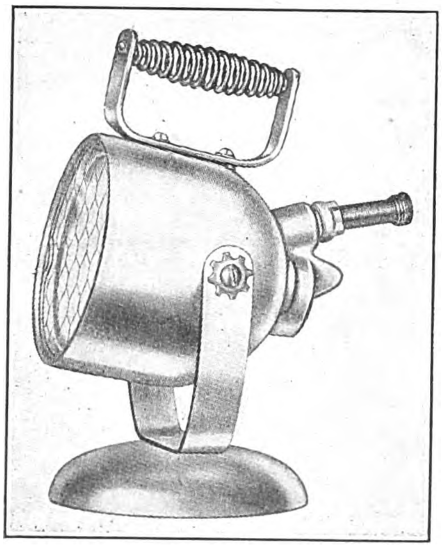
# New Equipment Available

## Improved Welding Rod Brought Out

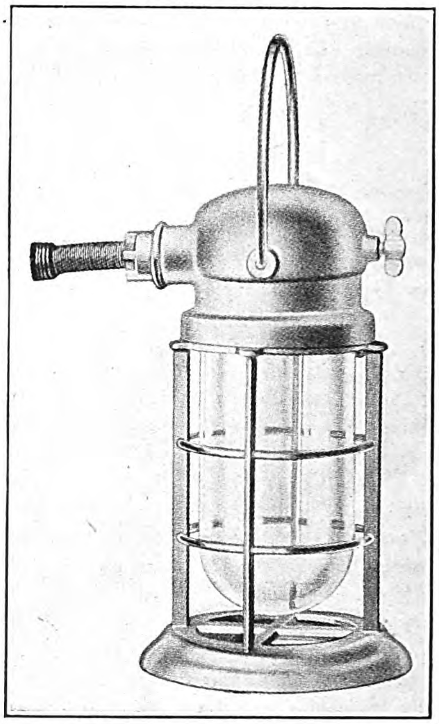
FOR welding by the carbon arc, the Rail Welding & Bonding Company, Cleveland, has brought out the "Una" joint rod, No. 200. The rod is coated and the base is a high-grade low-carbon steel. The elements necessary for producing the required physical properties in the metal are introduced into the weld as a coating on the basic steel rod. Rods are not coated until chemical analyses and tests of the physical properties show that they come up to required specifications. Frequent control tests are made to keep the composition of the coating within the required limit, and a final test is made to insure a uniform product. A detailed discussion of the essential elements, together with test data of joints made by this rod, is contained in the company's bulletin No. 107.

## Portable Electric Lanterns

TWO electric lanterns of novel type are being placed on the market by the Crouse-Hinds Company, Syracuse, N. Y. One of these is the type LM, which is a convenient portable inspection lantern for use in railway yards, shops, storerooms and other places where a strong, well-protected lantern is needed. The case is of cast aluminum, with a cast iron base, so as to give substantial support and prevent the lantern being easily upset.



An Electric Spot Lantern for Inspection Use



This Lantern Can Be Used Where Inflammable Vapors Are Present

A wound wire handle is mounted on the case for convenience in carrying and for directing the beam of light as desired. The body has a friction adjustment, so that the light can be revolved around a horizontal axis from 90 deg. above to 45 deg. below the horizontal. A lug prevents excessive movement. The front is inclosed by means of a wire glass, held against a gasket by a spring wire retaining ring. Provision is made so that it can be easily removed. The lighting cord enters the case at the back and is protected by a spiral wound spring, and a bushing.

The type VSB lantern is of the vapor-proof type for providing safe and convenient light in oil houses or places where an excessive amount of dust or a combustible vapor or gas is present. This lantern has a swinging bail, a water-tight cord outlet with reinforcement to prevent chafing of the cord. The globe, either plain or colored, permits the use of any lamp up to and including 75 watt.

The guard and globe can easily be removed for lamp replacement. The base gives the lantern a substantial support when placed upon the floor or ground. The body is of aluminum and the guard and base are of brass with galvanized finish.

# The News of the Industry

## Parking May Be Barred on Eleven Streets in Los Angeles

No parking on eleven principal streets of Los Angeles business district and the limiting of all parking downtown to thirty minutes instead of forty-five minutes is recommended to the city of Los Angeles by the parking survey committee which was created by the Council last year. In addition to the specific recommendation for changes in the parking rules, the committee has established definite policies regarding the relative importance of the use of city streets. In view of the fact that the personnel of the committee represents leading business and civic interests, the agreement on general policy is regarded as highly important. The City Council appropriated $10,000, enabling the committee to carry out a detailed survey and eliminate snap judgment from its report.

Four north and south streets and seven east and west streets should be free from parking, thus expediting through traffic movement, the committee reported. The committee also recommended that parking be eliminated around Pershing Square, which is the downtown park and the favorite haunt for real estate promotion buses and sightseeing cars.

Other recommendations included the following:

> Continuance of the present parking ban throughout the entire downtown district from 4 to 6:15 p.m. daily.
>
> Barring of real estate sale promotion buses from entire downtown district.
>
> Strict regulation of taxicab stands.
>
> Elimination of special parking privileges in front of theaters, etc.
>
> Strict prohibition of second line parking.

In classifying the several uses of streets in their relative importance, the committee said that movement of traffic was the prime purpose of streets.

With regard to the relative importance of the various uses of the streets, traffic movement was considered greatest, the committee report saying:

> We believe the conclusion sound that it is not the owners and users of the stored vehicle or the parked vehicle that mainly contribute to the business activity in the commercial center of the city, but that it is the owners and users of moving vehicles (street cars and automobiles) who constitute the purchasing and business factor in that district.

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## Germans Here to Study Rapid Transit

Three Germans representing the Hamburger Hochbahn Aktiengesellschaft arrived in this country on May 4 for the purpose of studying rapid transit. Wilhelm Mattersdorff and Wilhelm Stein, directors of the elevated railways of Hamburg, and Gustave Leo, chief of the Hamburg state civil engineering department, are the three visitors. After inspection of the subway and elevated lines in New York City they will visit Boston, Schenectady, Buffalo, Detroit, Chicago, Baltimore and Philadelphia. They are also interested to see the latest types of street cars and the newer operating practices.

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## Boston "L" Proposes Bus Expansion

Indications are that the Boston Elevated Railway soon will receive from the City Council of Boston a franchise to operate a bus line all the way from West Roxbury to Park Square in Boston, by way of the beautiful parkways in the city. The Elevated petitioned for the franchise, and included Boylston and Arlington Streets, Commonwealth Avenue, Charlesgate West, Fenway, Brookline Avenue, the park system and Center Street to West Broadway. This would be a most attractive ride.

When the case was heard before the Council jitney committee on May 5 there was registered an almost unanimous opinion in favor of the project, and it was one of the largest hearings of citizens ever held by a Council committee. The only opposition voiced was against certain details, and especially against buses operating in Commonwealth Avenue, the city's finest residential thoroughfare. This avenue can be avoided. The Council members indicated that they would be in favor of such bus line, desiring only to retain control over the actual route, stops and transfers, and before there is a final decision in the matter there will be a conference between Elevated officials and the Council committee.

This is regarded as an important opening wedge to an extensive bus service by the Elevated within the city limits.

Edward Dana, general manager of the Elevated, addressed the hearing, outlining the company's policy in this respect. He said in substance:

> The Elevated trustees have under consideration the expansion of its bus lines. This means in certain cases the discontinuance of trolley car service. I think I may state it as a general policy of the trustees to discontinue car lines in favor of bus service on short runs where the traffic density does not warrant the expensive relaying of expensive rails which are wearing out.
>
> This does not necessarily mean that on long runs the bus will replace the trolley. Buses couldn't handle mass transportation as well as railway service. Experience in this and other cities has shown that the street railway is the most economical means of transportation when traffic is heavy. Bus lines are an auxiliary to the railway system.
>
> In the problem of furnishing transportation, subway, elevated and surface trains, trolley cars and buses all have their parts to play. The city of London demonstrates that, and there the percentage of people carried by bus is the greatest we know. In London a third of the people transported by the city's carriers travel by bus.
>
> The bus is more an element for light traffic, and an auxiliary to the railway system, than one of economy.

## Chicago Purchase Conferences Progressing

A "neutral" board of nine members will supervise the control and operation of the co-ordinated surface and elevated lines of Chicago during their period of transfer from the companies to the city. This was virtually decided at the seventh purchase conference between representatives of the city and the lines, held on May 6.

Three members of the board will represent the city, three more will be from the companies and the balance of the power will be lodged in three others, who will be chosen jointly.

At the beginning of the series of conferences held to discuss all phases of the proposed municipalization of the lines Mayor Dever contended that the city should have a majority of the representation. The bankers present at the conferences, however, pointed out that since the railways would hold the securities of the city issued in payment for the properties, they should likewise have as close as possible to a majority control until the city has paid off 51 per cent of the indebtedness incurred when the purchase is consummated.

Consideration of the price to be paid for the lines remains as the big problem for the conferees to settle. While neither the officers of the city nor the representatives of the properties have issued any statements about the conferences, it is know that little progress has been made in that respect.

Three proposals are under consideration by the Mayor. They provide:

> 1. That the city pay the market value of the securities.
> 2. That the $162,500,000 total of the surface lines' capital account be accepted as the basis for price negotiations.
> 3. That a new valuation based on present day costs be made.

The first is generally regarded as the favorite of the Mayor, although he has not committed himself to any plan.

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## Competition in Syracuse on Bus Privilege

The Syracuse Railway Co-Ordinated Bus Line, Inc., Syracuse, N. Y., has been incorporated to operate a stage or omnibus route with capital of $50,000. James F. Hamilton, Rochester; Benjamin E. Tilton and William P. Gannon, Syracuse, are the directors. The law firm of Gannon, Spencer & Mitchell, Syracuse, is counsel for the corporation.

At the same time and in competition the Whitehouse Trucking Company is petitioning for a license for city-wide operation of motor buses in Syracuse with a 7-cent fare and transfer privilege. This company has operated a large motor trucking business in Syracuse and is prepared to establish bus lines to serve all sections of the city.

## Mr. Delaney to Head New York City's Board of Transportation

Mayor Hylan of New York has declared his intention to appoint John H. Delaney, chairman of the prospective Board of Transportation under the recently enacted transit law. The Mayor says he expects to take this action on July 1, when the Board of Transportation takes over from the present State Transit Commission the task of routing, planning and building new subway lines.

The Mayor has not intimated the names of the two associate commissioners to co-operate with Mr. Delaney, but he has indicated that each commissioner ought to receive at least $15,000, which is the amount paid the present Transit Commissioners.

In extenuation of the Board of Estimate's course in virtually scrapping all recent plans for new subways, the Mayor declared that the plans submitted by the Transit Commission for the approval of the Board of Estimate "would not be recognized as the same plans when finally voted upon by this board, they have been so completely revised and modified to correct errors and eliminate blunders that have been discovered by the Transit Conference Committee appointed by this board."

The Mayor has also said he believed the time for putting the new law into effect "was purposely delayed in order that a public clamor might be aroused to compel the Board of Estimate to adopt plans that had been prepared by the present Transit Commission for subways that would connect with the transit-corporation controlled subways."

In replying to Mayor Hylan's aspersions, Transit Commissioner Harkness said that the plans which the Mayor criticised as full of blunders were prepared by the same engineering staff that made the plans for all the subways, going back to the first of them more than twenty years ago; that it is the most experienced staff of subway engineers in the world, and the very "same staff whose services Mayor Hylan, requests the State Transit Commission to place at the disposal of the future Chairman (Mr. Delaney) of the Board of Transportation."

## Discrimination Charged With Respect to Oakland Fares

The Key System Transit Company in the past has been selling a round-trip fare for 36 cents from San Francisco to Oakland, Cal., including a coupon of admission to Idora Park. This kind of a ticket is not being sold from other points in the Oakland territory to Idora Park, where the one-way fare is the same as from San Francisco to the Park. Also no such arrangement is in effect via the Southern Pacific from San Francisco to Alameda-Neptune Beach, where the one-way fare is the same as from San Francisco to Oakland-Idora Park.

Protests have been filed with the Railroad Commission by the city of Alameda and the Neptune Beach management, alleging that the practice is discriminatory and in violation of the State Constitution and the public utilities act.

The commission has rejected certain temporary tariffs issued by the Key System effective on April 30. It will now be incumbent upon the transportation company, should it desire to carry the matter further, to commence a formal proceeding in order that the issues may be decided upon the question of fact and in conformity with the law.

## New Bus Lines of Connecticut Company

The Connecticut Company will start local bus service in New Haven on May 15, when machines will start operation from the "Green" out Goffe Street to Springside Avenue in Westville. Heretofore the company has been operating a number of long distance lines out of New Haven. In addition to this prospective service the company began on May 5 a bus line on South Lenox Street, Waterbury, Conn. The new service was referred to by W. J. Flickinger, assistant to the president, at the joint meeting of the Connecticut Company Section of the A.E.R.A. and of the Connecticut Company Railway Club of New Haven on May 6, which took the form of a housewarming at the new bus garage in New Haven. The company now has forty-eight buses in service with two 29-passenger buses on order. The forty-eight buses represent an investment of $278,000, but, considering the stores for buses and new garage, the total investment approximates $400,000.

L. S. Storrs, president of the company, emphasized the point that while the company would use buses extenssively, it was his expectation that the railway would for many years to come do the big bulk of the business.

## Railway Joins in "Clean-Up" Drive

During the period from April 21 to May 5 the Chicago Surface Lines cooperated with the city authorities of Chicago by taking part in a city-wide "clean-up" campaign. Coming, as it does, immediately after the period when March and April rainy weather makes it particularly difficult to keep cars clean, this was made the occasion for an intensive drive to direct attention toward the importance of cleanliness of equipment and property.

In the equipment department, particular attention was paid to the condition of car floors and windows. The members of the supervisory force of the department devoted a large part of their time toward directing and following this work, so as to accomplish the best results possible. A consistent effort is also being made in the equipment department to carry this interest in cleanliness beyond the period of the "clean-up" drive. Preliminary plans are under way for the installation of additional car washing and cleaning facilities at car houses and shops.

Another phase of the "clean-up" campaign was the purchase of new uniforms by trainmen to prepare for the annual inspection on May 1. More than 6,000 trainmen purchased new uniforms. The demand was so large that the uniform stock of local stores was entirely exhausted.

## Former Railway Commissioner on Cleveland Arbitration Board

James W. Holcomb, street railway commissioner at Cleveland in 1922 and 1923, has been named as the fifth member of the board of arbitration which will decide the dispute between the Cleveland Railway and its platform employees over a wage increase and changed working conditions.

The other members of the board of arbitration are: Atty. Charles Higley and Thomas P. Schmitt, a director of the railway, representing the company, and United States District Attorney A. E. Bernsteen and Max Hayes, editor of the *Cleveland Citizen*, Cleveland labor publication, representing the men.

The men are demanding a wage increase that would make the maximum rate of pay 90 cents an hour after the first year of service, with a minimum wage to start with of 85 cents an hour. Their present wages are 55, 57 and 60 cents an hour. The men are also asking two weeks' vacation with pay each year, one day off with pay in eight, and time and a half for all overtime, Sunday and holiday work.

John J. Stanley, president of the company, says that to meet the men's demands it would be necessary to charge a 10-cent fare in Cleveland.

The board will hold its first meeting on May 15. Attorney William L. Day will represent the men before the arbitrators, while Attorney Harry J. Crawford will act for the company.

## Deadlock in Pittsburgh

The conference looking toward an adjustment of the differences between the Pittsburgh Railways and its employees on the wage issue held on May 8, at which were present company and carmen's officials, with Mayor Magee acting as mediator, ended in a deadlock. It is reported that the men are preparing to take another strike vote. Another meeting took place on May 7 at which propositions were advanced by the Mayor, the company and the men. The men are seeking a scale of 75 cents for the ensuing year and 77 cents for next year under a two-year agreement and for certain changes in the working conditions.

## Conferences on New York State Wages

Representatives of the employees of the Rochester, Syracuse and Utica lines of the New York State Railways conferred on May 7 with President Hamilton in the hope of obtaining another proposition to submit to the men. If a satisfactory arrangement cannot be reached arbitration will be resorted to, with the company probably demanding separate arbitration proceedings in each city. The men recently rejected the offer of President Hamilton for a renewal of the contract which expired on May 1 with a wage reduction of 2 cents an hour. This would make the new scale 49, 51 and 53 cents an hour. The vote was almost unanimous. The demands of the men, submitted a short time ago, called for a scale of 66, 68 and 70 cents and a six-day week, with a 10-cent increase over the amounts for operators of one-man cars.

## Fare Hearings Concluded in Baltimore

The Maryland Public Service Commission has concluded hearings on the petition filed by the United Railways, Baltimore, making application for permission to increase the fare rate from 7 cents. The commission is expected to hand down its decision in the near future. At the same time action also is expected on the request made by C. D. Emmons, president of the railway, to have the company's property valued.

Although the petition filed by the company left the amount of increase to the commission, in the arguments by counsel for the United Railways, it was said that the company wants an increase of ½ cent and also seeks relief pending the valuation. A great many applications for the elimination or extension of fare zones have been made to the commission and the company representatives told the utilities board that with a ½-cent increase in fare some of these could be granted.

## City Sues Railway Operating at Hartford

Papers have been served on company officials by which the city of Hartford, Conn., has instituted action against the Connecticut Company, providing for an attachment to the value of $100,000, and claiming specific performance by the company of all provisions of the Tucker grant, an accounting by the company, $100,000 damages, the appointment of a receiver of fares and income of the company within the city of Hartford, and "such other and further relief as justice and equity may appertain."

The case has grown out of the failure of the company to pay the city an amount estimated to be about $50,000, representing 2 per cent of the gross fares collected within the city limits in the calendar year of 1923. Payment was due in February. The complaint cites the particular phases of the agreement which the city alleges have not been fulfilled by the company.

By vote of the Democratic majority in the Common Council several weeks ago, one-man cars were banned in Hartford, effective in June.

## Memphis Men Granted Three Cents an Hour Increase

Under a recent decision of an arbitration board motormen and conductors of the Memphis Street Railway, Memphis, Tenn., have received an advance in wages of 3 cents an hour, making the scale for first-year employees 45 cents and hour, second-year men 50 cents and older employees 55 cents. The decision of the board affects 600 trainmen, carhouse and shop repair men. The wage increase, which is retroactive to April 1, will mean $54,000 annually to the railway management. The contract provides that the men will work six days out of every week. Pay at the rate of time and a half is allowed for overtime in addition to the regular pay. E. B. LeMaster, representing the Memphis Street Railway on the board, filed a minority report declaring the increase was unwarranted and "no burden should be added to the public unless the evidence submitted to the board clearly justifies it." It is reported that the company will announce in a short time an 8-cent fare with ten tickets for 75 cents.

## President Hamilton Enlightens Author of Five-Cent Bill

President George E. Hamilton of the Capital Traction Company and Senator McKellar of Tennessee, author of the 5-cent fare bill for the District, clashed on May 5 at the hearing on the fare bill over the original financing of the company and the right of Congress to disregard arbitrarily the findings of the Public Utilities Commission and provide a 5-cent fare. Senator McKellar insisted that bonds of the Washington & Georgetown Company, of a face value of $4,000,000, had been reckoned at $8,000,000 in making the transfer of the property. Mr. Hamilton proceeded to explain that the securities of the Washington & Georgetown Company were highly regarded in Washington; that the assessed value of the stock was $275 a share and that there was the expectation that the bonds would be exchanged for the stock. He finally insisted that the sale price of the Washington & Georgetown Company was not considered by the Public Utilities Commission in fixing the fair valuation of the Capital Traction Company, and, therefore, had no connection with the present rate of fare in the District.

## New Bus Line Opened in Philadelphia

Operation of a new bus line in the Stenton section of Germantown was started on May 3 by the Philadelphia Rural Transit Company, a subsidiary of the Philadelphia Rapid Transit Company. A certificate of public convenience for operation of the line was granted a few days ago by the Public Service Commission.

The new bus line begins at the intersection of Mount Airy Avenue and Stenton Avenue, and extends thence along Stenton Avenue to Washington Lane, thence along Washington Lane to Chew Street, thence along Chew Street to Belfield Avenue, thence along Belfield Avenue to Haines Street, thence along Haines Street to Germantown Avenue, thence returning along Germantown Avenue to High Street, along High Street to Belfield Avenue and thence over the same route to the place of beginning.

The company is operating twenty-nine-passenger single-deck buses. The fare is the same as that of the company bus route previously placed in service, namely, 10 cents cash fare for a one-way trip. The privilege of interchange in a forward direction exists between the bus route and connecting lines, surface, subway or elevated, of the Philadelphia Rapid Transit Company by means of an exchange ticket, the price of which is 3 cents. In the case of passengers transferring from the Philadelphia Rapid Transit Company lines to the buses, however, 3 cents cash, in addition to an exchange ticket, must be paid.

## Office of Street Railway Commissioner at Toledo Open

Members of the Board of Street Railway Control at Toledo, Ohio, declared that the field is open for a successor to W. E. Cann, whose resignation as street railway commissioner, to enter the motor manufacturing field, is noted elsewhere in this issue. The members of the board will probably take the matter up at a special meeting before June 1.

W. W. Knight, president of the board, is now in California, but is expected to return about May 20. The regular monthly meeting is scheduled for May 15, at which time the resignation will be acted upon.

It has been hinted that W. T. Jackson, city service director, may be appointed to the office and combine the work of the two departments temporarily. This plan would save both city and car-riders money, it is believed, and provide a man for the commissioner's job thoroughly acquainted with present plans and future needs.

E. L. Graumlich, engineering assistant to the commissioner, has also been mentioned as a possible successor to Mr. Cann. He went to Toledo after experience in the office of the Street Railway Commissioner at Cleveland.

## $1,000,000 Improvements in Philadelphia Approved

The committee on transportation and public utilities of the City Council of Philadelphia recently voted approval of the ordinance introduced by Councilman Hall authorizing the Philadelphia Rapid Transit Company to issue first mortgage bonds up to $1,000,000 for the purpose of retiring $389,000 of the company's real estate mortgage bonds and to provide funds for necessary transit improvements. The bonds to be issued for these improvements, which were outlined in the ELECTRIC RAILWAY JOURNAL, issue of April 19, will be twenty-year 6 per cent bonds, secured by mortgages on the company's real estate.

When the matter was taken up by the committee Councilman Cox called attention to the fact that there still is in Council a bill, introduced several months ago, authorizing the P. R. T. to create a loan of $1,000,000 for financing the purchase of buses for the Philadelphia Rural Transit Company. Mr. Cox was told the new loan ordinance will supersede the one to which he referred, and that the $1,000,000 is to be used for making certain improvements named in the new bill instead of for the purchasing of motor buses.

## Appeal of City of Buffalo Against Higher Fare Dismissed

The United States Supreme Court on May 5 dismissed for want of jurisdiction, without a written opinion, the appeal of the city of Buffalo from the decision of the New York Supreme Court upholding an order of the New York Public Service Commission increasing the rate of fare to be charged by the International Railway from 5 cents to 7 cents, with four tokens for

25 cents. No Federal question was found to be involved.

The city sought to appeal on the ground that the constitutional inhibition against violation of contracts had been encroached upon. The city contended that under franchise contracts granted predecessor corporations the rate of fare in Buffalo was limited to 5 cents, with free transfers. The State Public Service Commission once held that it had no authority to grant an application by the company for increased fare. This case was taken to the State Supreme Court, which held to the contrary. The Public Service Commission then proceeded to a hearing and granted the increase. This the city resisted, losing in the state courts and then attempting to carry the case to the United States Supreme Court.

## Byllesby Officers Advanced

Directors of H. M. Byllesby & Company, Chicago, have elected Arthur S. Huey chairman of the board and John J. O'Brien president, to succeed the late Col. H. M. Byllesby. Robert J. Graf has been elected first vice-president. The same men have been elected to fill these offices for the Standard Gas & Electric Company and the Northern States Power Company. All three were associated with Colonel Byllesby and with him composed the executive committee. Henry C. Cummins and Albert S. Cummins, nephews of Colonel Byllesby, were both elected vice-presidents, the former of H. M. Byllesby & Company and the latter of the Standard Gas & Electric Company and the Northern States Power Company.

## Low Fares on California Line to Stimulate Traffic

The Railroad Commission of California has authorized the Peninsular Railway to reduce to a new low basis for a six months' experimental period reduced one-way and thirty-ride commutation fares between all points on the line.

As illustrated, the one-way fare at the present time between San José and Los Gatos is 40 cents, the new fare will be 25 cents; between San José and Mayfield the present fare is 60 cents, the new fare will be 50 cents; the present thirty-ride family commutation ticket between San José and Los Gatos is $8, the proposed fare $5.

The Peninsular Railway, owned by the Southern Pacific Company, has never been a financial success. The total corporate deficit as of Dec. 31, 1923, was $3,438,107, with an income loss in 1923 alone of $377,737.

The application to the commission states that practically every one owns an automobile in the territory through which the line operates and that the revenues have been steadily decreasing. In the year 1923 the railway operating revenue was $16,492, less than during the year 1922, and the first three months of 1924 show a very severe decrease over the same months of the year 1923.

It is to be hoped that the further reductions in the fares will attract sufficient additional business at least to pay operating expenses and taxes.

## Detroit Municipal Will Not Deal with Union

A petition on stationery bearing only a union printer's label and signed by 3,200 platform employees of the Detroit Department of Street Railways has been presented to Joseph A. Martin, acting Mayor, informing him that they have authorized a committee to represent them on all questions of wages and working conditions. The committee named included sixteen platform employees and in addition W. D. Mahon, William B. Fitzgerald and R. L. Reeves, all Amalgamated officials.

Mr. Martin advised a delegation of union officials who sought to call his attention to new grievances that the law and the City Charter must be obeyed in letter and spirit by city employees and officials or their connection with the city government will end. This delegation included the first international vice-president of the Amalgamated Association. Its members complained that the street railway commission had forbidden the circulation of petitions addressed to the acting Mayor, at carhouses. It was intended by means of these petitions to verify the statements that the delegation represented a majority of the men, and that they were forbidden by the commission to collect union dues in the carhouses. It was contended by the representatives of the men that the commission's stand violated an unwritten understanding that the *status quo* was to be maintained in the present wage controversy pending the coming conference between Mr. Martin and the Street Railway Commission.

The petition presented to Mr. Martin was circulated during the week ended May 3 in violation of a departmental order, according to a statement by Ross Schram, assistant general manager of the D. S. R. It was stated that division superintendents stopped the circulation of the petition because it is a long standing rule that no petitions, no matter what their nature, are to be circulated among the railway men while at work. This ban, it was claimed, was especially aimed against political petitions. Mr. Schram stated that regardless of the policy of the D. S. R. or D. U. R. in the past, no dues will be collected in the future on D. S. R. property.

Mr. Martin has again made it clear that the city cannot deal with the union. The present controversy started when the men recently asked for a 14 per cent increase in wages and a revision of working conditions. On the basis of the earnings of the company for 1923 this increase would more than wipe out the surplus shown from operation.

## Traffic Survey Work Started at Los Angeles

The Los Angeles Board of Public Utilities on April 22 opened up special offices for the use of R. F. Kelker, Jr., of Chicago, who has been engaged to make a survey of the transit situation for the city of Los Angeles.

In accordance with a joint agreement between the city of Los Angeles and Los Angeles County, an expenditure of $40,000 will be shared equally by the city and the county for this work. Of this amount Mr. Kelker will receive $15,000 for his services.

Mr. Kelker will include in his studies subways, open cuts, elevated lines and motor bus operation as well as surface railway service. The idea behind the inquiry is to provide for a program for future development. It is expected that the work of the engineers will start at once.

## Michigan Roads Elect Officers

At a meeting of the stockholders of the Grand Rapids, Holland & Chicago Railway, the Michigan Railway and the Michigan Electric Railways, G. R. Cottrelle, Toronto, was elected president of the Michigan Electric Railways, with J. F. Collins vice-president and general manager. B. C. Cobb, New York, was elected president of the Michigan Railways, with Mr. Collins general manager. Niel M. Viergever, Grand Rapids, and O. H. Degener, Jackson, were elected secretary and treasurer respectively of all three companies.

## War on One-Man Car Renewed on Coast

The war on one-man cars has spread to Berkeley, Cal., following their withdrawal from Oakland. Mass meetings have been held, and legal action is threatened to force the cars out of service, despite the fact that one-man cars are being operated in Berkeley under a six months' agreement, arranged on April 21.

Demand for removal of the one-man cars followed a collision on Sunday, April 27, between a one-man car of the Key System Transit Company and a Southern Pacific electric train at Ashby Avenue and Adeline Street in daylight. The crossing at this point was protected by two flagmen who are said to have displayed the proper signals. No one was hurt, but one girl has since been prostrated by her experience as a passenger on the one-man car. Officials of the Key System and Berkeley police started an investigation.

Following the accident, the foes of one-man cars held an indignation meeting to which Vice-president and General Manager W. R. Alberger of the Key System was invited.

The Berkeley trouble served as a spur to those Oaklanders who have been protesting against the operation there of the safety type of cars. The latter have been taken off the long runs on Telegraph Avenue in Oakland, but are still running on a number of feeder lines in that city. Petitions have been circulated and the City Council has been asked to take action in this case.

In the meantime, the city of Oakland is going ahead with its complaint to the State Railroad Commission against the service of the Key System, which is soon to come up for a hearing.

The Oakland Chamber of Commerce has appointed a special transportation committee and mailed a questionnaire to its 3,000 members requesting them to offer suggestions as to how the railway service can be improved. One of the criticisms most frequently heard concerns the character of the cars now in use on some of the lines.

## News Notes

**Mount Vernon and Yonkers Included in Electrification Bill.**—Governor Smith has signed the Garnjost bill, as Chapter 626 of the Laws of 1924, amending Section 53-a of the Public Service Commission law, requiring the electrification of all railroads within the limits of a city adjoining the city of New York before Jan. 1, 1926. The section requiring the electrification of all railroads in Greater New York became a law in 1923 and the amendment to the law affects the cities of Mount Vernon and Yonkers.

**Parking Rules Necessary.**—The "park as you please" order which was tried out in Akron, Ohio, for ten days as an experiment has proved a failure, with the result that it has been abandoned and stringent parking rules put into effect. Merchants and many auto drivers themselves voiced loud protests against the plan. Other cities in northern Ohio, notably Canton, Massillon, Alliance and Warren, are invoking stringent parking regulations.

**Wages Same for Another Year.**—Trainmen on the city division of the Northern Ohio Traction & Light Company, Akron, Ohio, at a mass meeting held recently voted a continuance of service for another year at the present wage scale. It is probable the Canton and Massillon City men and the interurban men will do the same. The old wage contract expired May 1. Few changes were made in the working conditions.

**Urges Early Date on Hearing.**—Earliest possible hearing of the application of the city of Los Angeles, joined in by the Railroad Commission, for an order requiring construction of a union passenger station and elimination of grade crossings in that city is urged upon the Interstate Commerce Commission by the Railroad Commission of California in a telegram recently forwarded to Washington.

**Bus Permit Granted.**—The Delaware River Coach Company, a subsidiary of the New Jersey & Pennsylvania Traction Company, Trenton, N. J., has been granted a twenty-five-year franchise by the City Commission of Trenton, N. J., to operate a bus line between Trenton and Morrisville, Pa.

**Demands to Be Sent Officials.**—The presentation of demands to be embodied in the new working agreement between the Tri-City Railway, Davenport, Iowa, and the union is to go to the company officials by the executive committee of the union. The present agreement, signed a year ago, provides for the opening of negotiations at least thirty days prior to the expiration of the agreement. June 1 is the date of this expiration.

**Many Hurt When Car Gets Beyond Control.**—More than thirty persons were injured just before 6 o'clock on May 7 when a one-man Ogden Avenue car got beyond control on the grade down the 155th Street viaduct in New York City and smashed into a crowded trolley standing in its path. George Serfert, motorman of the one-man car, was among the injured. He was taken unconscious to Columbus Hospital. William E. Thompson, superintendent of traffic for the Third Avenue Railway, said that he had been unable to ascertain the cause of the accident owing to Serfert's condition.

**Tax Expert Honored.**—J. H. Moran, general auditor of the Boston Elevated Railway, has been appointed by Governor C. H. Cox to represent the Commonwealth of Massachusetts at the seventeenth annual conference on taxation at the Hotel Chase, St. Louis, on Sept. 15. This honor has been conferred on Mr. Moran by the Governor because Mr. Moran has become very well known in Massachusetts as a specialist on taxation problems.

**Six Buses Serve.**—Two more buses have been added to the equipment of the Wisconsin Traction, Light, Heat & Power Company for service from Appleton, Neenah and Menasha. This brings the total number of buses serving these cities up to six.

**Chicago "L" Posters Reproduced.**—*World's Work* for May contains a two-page story, with six illustrations of artistic posters, recently issued by the Chicago Elevated Railways and the North Shore Line.

**New Council for Cincinnati Commission.**—John V. Campbell, former Hamilton County prosecutor, was elected to succeed Judge Frederick L. Spiegel as legal counsel for the Rapid Transit Commission of Cincinnati, Ohio, at a meeting of that body May 3. Judge Spiegel's resignation was recently accepted, to take effect July 1.

**Cars Will Observe Highway Signs.**—Street cars in La Crosse will observe the arterial highway stop signs the same as any other vehicle does, according to a recent announcement of Superintendent C. L. Hedges of the Wisconsin Railway, Light & Power Company. Beginning at once, cars will come to a full stop when crossing or entering an arterial highway, whether there are passengers getting on or off.

**Many Injured.** — One woman was killed and twenty-seven injured seriously on May 3 when two interurban cars of the Southwest Missouri Railroad collided on a curve a mile west of Lowell, Kan.

**May Operate Buses.**—The Janesville Traction Company, Janesville, Wis., has under consideration the question of abandoning its Washington Street and Cemetery Street car lines. If permission is given by the commission the company proposes to purchase buses for use on these lines.

**City Gets Right for Construction.**—The Public Service Commission recently issued to the city of Philadelphia certificates of public convenience for the Broad Street subway and the Chestnut Street surface car-subway recommended by the Philadelphia Rapid Transit Company. This was the last requirement needed before beginning the work on the proposed high-speed transit lines. The commission's order authorizing the Broad Street subway provides for a tube under Broad Street, with necessary branch lines extending northeast and northwest that may be planned later; a subway in Ridge Avenue, extending from Broad Street to Eighth Street, to Walnut Street, over the Schuylkill River by a new bridge near Sansom Street, thence in Chestnut Street to Forty-second Street, and thence by elevated railway over Woodland Avenue to the city line. The project will cost about $11,000,000.

**Another Paper Appears.** — "United Service" is a new monthly publication being issued by the Spokane United Railways, Spokane, Wash., for its employees. M. W. Birkett, vice-president and general manager of the company, stated that he hoped the publication would become an institution and grow with the company. Its aim is to promote friendship and understanding, to arouse interest among employees and to provide a means of communication for all branches of the service.

**Fares Increased.**—An increase in fare on the lines of the Wahpeton-Breckenridge Street Railway, connecting Wahpeton, N. D., and Breckenridge, Minn., line from 5 to 7 cents as a temporary measure has been granted jointly by the North Dakota and the Minnesota Railroad Commissions.

**Ohio Company on Strike.**—City and interurban employees of the Stark Electric Railroad, Alliance, Ohio, went out on strike on May 1 following the refusal of the company to accede to their demands for a 9-cent increase in wages. The company originally asked a 10-cent cut in hourly wages, but later modified this to a 4-cent cut. The men rejected the offer.

**Arbitration to Start May 19.**—Arbitration proceedings looking toward a settlement between the Scranton Railway, Scranton, Pa., and its employees, who have sought a 17-cent wage increase, will commence on May 19. This was decided recently following the decision of Bishop Hoban to act as third arbiter. The two other arbitrators are Attorney John M. McCourt for the company and L. F. Hart for the car men. Arbitration of wages is the carrying out of an agreement of a month ago whereby the men accepted the rush-hour run sought by the company and consented to let the matter of wages go to arbitration. This terminated at that time the four-day strike, which was referred to in the ELECTRIC RAILWAY JOURNAL in the issue of April 12.

**More About One-Man Cars in Jersey.**—In No. 1 of Vol. 4 of "Whys and Other Whys of the Trolley Situation," published by the Public Service Railway, Newark, N. J., the connection between one-man cars and better service is explained. The company claims that when this type of car is operated the service is better, headways shorter and the public accordingly pleased. The company contends further that they can be operated with the same speed as two-man cars and that they can be operated with a high degree of safety. Also that operation of the one-man cars works no hardship upon the trainmen. Co-operation is asked of the patrons of the Public Service Railway, the men and management in return pledging their utmost efforts in providing good service.

# Financial and Corporate

## Plan Arranged for Extension of Michigan Railroad Bonds

The management of the Michigan Railroad, Jackson, Mich., has approved the extension for ten years of the maturity date of its $4,050,000 of first mortgage 6 per cent bonds due on May 1, to May 1, 1934, giving the holder at the same time his choice of two options.

Under option A the holder of a $1,000 bond who deposits his bond in acceptance of the option, upon consummation of the plan, will receive $1,000 principal amount in first mortgage bonds to which will be attached the extension contract and new semi-annual coupons for interest at the rate of 6 per cent per annum and $200 par value (two shares, par value $100 per share) of Michigan Railroad 6 per cent preference stock.

Under option B the holder who deposits his bond in acceptance of that option, upon consummation of the plan, will receive $1,000 par value (ten shares par value $100 per share) of 7 per cent cumulative prior preferred stock of the Michigan Railroad and $800 par value (eight shares, par value $100 per share) of 6 per cent preference stock of Michigan Railroad.

It is explained to the holders of the Michigan Railroad first mortgage five-year gold bonds, Series A, 6 per cent, due May 1, 1924, that for many months the management of the Michigan Railroad has been endeavoring to arrange for the refinancing of the $4,050,000 of first mortgage 6 per cent bonds due May 1, but that prevailing conditions make it impossible to sell a new issue of securities for the purpose of refunding these bonds, so that the company will not be able to pay in cash the principal thereof at maturity.

The outstanding $4,050,000 first mortgage bonds are part of an original issue of $4,500,000, of which $450,000 bonds have been acquired and canceled through operation of the sinking fund. The company also has outstanding $4,000,000 of general mortgage bonds due May 1, 1924, and a floating debt of approximately $1,500,000 for advances on open account. All of the general mortgage bonds, the floating indebtedness above mentioned and all of the capital stock of the Michigan Railroad are owned by a subsidiary of the Electric Railway Securities Company.

The extended bonds will be redeemable, at the option of the company, at their face value and accrued interest at any time upon forty-five days' published notice. The extension agreement to be executed by the company will contain protection provisions and for annual sinking fund payments beginning Nov. 1, 1926.

President Cobb states that the Electric Railway Securities Company, the holding company for the Union Railway Gas & Electric Company, of which the Michigan Railroad is a subsidiary, has agreed "to cause to be canceled or otherwise satisfied all the general mortgage bonds" and the floating debt of the railroad company, "so that the company then will have no funded indebtedness other than the first mortgage bonds and no floating indebtedness except current accounts."

## Receivership in Birmingham Formally Lifted

Receivership under which Birmingham's railway system has operated since 1919 was lifted on May 3 with the formal order of Judge William I. Grubb of the United States District Court, discharging Lee C. Bradley and J. S. Pevear, co-receivers. The Birmingham Electric Company, which purchased the properties of the Birmingham Railway, Light & Power Company and of the Birmingham Tidewater Railway at the recent receiver's sale, immediately took over full charge of the operation of the lines.

All debts of the Birmingham Railway, Light & Power Company and of the Birmingham Tidewater Railway have been paid and the final details of the reorganization have been completed, according to the reports filed in court prior to the order discharging the receivers.

Work on track changes by which the Tidewater Line, formerly an independent line, will be consolidated with the other railway lines, under an agreement between the company and the city, will start as soon as material has been received, it is stated. Something like sixty days will be necessary to complete the changes, according to statements of company officials.

In the transfer of all properties of the Birmingham Railway, Light & Power Company, Birmingham, Ala., and of the Tidewater line to the newly organized Birmingham Electric Company, referred to in the ELECTRIC RAILWAY JOURNAL, issue of April 26, the Edgewood Street Railway was not included.

## April 1 Deficit in Cincinnati $607,342

Exclusive of the deferred city franchise tax for the period from Jan. 1, 1920, to Oct. 1, 1923, which aggregates $1,312,500, the report of W. J. Kuertz, Cincinnati street railroad director, for March shows that the accumulated deficiency of the Cincinnnati Traction Company to April 1 is $607,342. Of that amount $429.342 represents return on capital, and $175,000 franchise tax due the city from Oct. 1, 1923 in addition to $3,000 franchise tax due the city of Norwood. The total revenue obtained by the company during March was $782,890 while the expenditures were $815,447 leaving a deficit for the month of $32,557. The total number of revenue passengers for the month was 9,032,651, as against 9,509,607 for the same period last year, or a decrease of 476,956. Increased cost of fare, use of automobiles and inclement weather are assigned as some of the reasons for the falling off of street car patronage.

## $642,076 Net After Interest Charges for Key System Transit

The Key System Transit Company, Oakland, Cal., has reported to the California Railroad Commission for the year ended Dec. 31, 1923, regardless of ownership or control. On Dec. 31 the Key System Transit Company acquired the properties formerly owned by the San Francisco-Oakland Terminal Railways, which operated such properties from Jan. 1 to July 16, 1923. From July 17 to Dec. 30 the properties were operated by Hugh Goodfellow, Warren Olney and W. I. Borbeck, trustees for the bondholders. The report shows:

| | |
|---|---|
| Operating revenue | $7,219,595 |
| Operating expenses | 5,527,960 |
| Net revenue | $1,691,634 |
| Revenue from auxiliary operations | 137,837 |
| Total net operating revenue | $1,829,471 |
| Taxes | 418,551 |
| Operating income | $1,410,920 |
| Non-operating income | 20,263 |
| Gross income | $1,431,184 |

The last-mentioned figure represents the amount available for rent of leased roads, interest payments on funded and unfunded debt, dividends on stock and additions to surplus. The annual interest charges of the Key System Transit Company have been reported to the commission as $789,108. The operating expenses of the company include $599,575 account of depreciation.

## $500,000 of Railway Stock Offered to Customers and Investors

The Charleston Interurban Railroad, Charleston, W. Va., is offering direct to local investors $500,000 of its 6 per cent cumulative participating preferred stock of a par value of $100 a share at the market at a price to yield about 7 per cent. The stock will participate equally in additional dividends in any year after $6 per share has been paid on 15,000 shares of common stock.

The company explains that it plans to use 4,250 shares of the preferred stock for the purpose of acquiring all the capital stock of the Kanawha Valley Traction Company and Charleston Dunbar Traction Company and 750 shares for the purpose of providing funds for paying for certain improvements to the property of the company, and that the residue of preferred stock will be used only for the purpose of purchasing or retiring its bonds, or acquiring or making additions, extensions or improvements to its property. None of the stock is to be used for additions, extensions, or improvements unless the net earnings of the company for the year preceding the proposed use of preferred stock for such purpose shall at least equal the interest requirements on its funded indebtedness plus twice the amount of the annual dividends on the preferred stock then outstanding and proposed to be issued for such purpose. In any case the par value amount of stock so used is not to exceed the actual cost or fair value, whichever shall be lower, of the additions, extensions or improvements for which the stock is used.

The company explains that the earnings available for dividends on the preferred stock and for depreciation are more than five times the dividend requirements on the preferred stock to be issued. The company reports a surplus of $191,153 for 1923 available for depreciation and dividends after the payment of taxes and operating expenses. The Kanawha Banking & Trust Company, Charleston, is participating with the company in the offering.

## Fonda, Johnstown & Gloversville Earnings Down

A comparison of the total revenues and expenses and net revenue from operation of the Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y., for the fiscal year, with similar figures for the year 1922 follows:

| | 1923 | 1922 |
|---|---|---|
| Railway Operating Revenues— | | |
| Freight revenue, steam division | $569,014 | $487,220 |
| Passenger revenue, steam division | 51,811 | 42,104 |
| Passenger revenue, electric division | 778,124 | 816,464 |
| All other revenue from transportation | 57,049 | 52,561 |
| Revenue from other railway operations | 14,859 | 11,296 |
| Total operating revenues | $1,471,218 | $1,409,648 |
| Railway Operating Expenses— | | |
| Maintenance of way and structures | $165,595 | $166,201 |
| Maintenance of equipment | 157,015 | 129,941 |
| Traffic expenses | 7,580 | 9,187 |
| Power | 88,570 | 74,870 |
| Transportation expenses | 394,409 | 368,181 |
| General expenses | 85,522 | 82,099 |
| Total operating expenses | $898,695 | $830,481 |
| Net operating revenues | $572,523 | $579,167 |
| Per cent operating expenses to operating revenues | 61.09 | 58.91 |

Gross revenues for the year were $1,471,219, the largest in the history of the company and an increase of $61,571 over the previous year. All classes of revenue showed an increase, with the exception of the electric division, which decreased $38,341, partly due to the strike on the lines of the Schenectady Railway.

The net income available for dividends was $169,469 in 1923 compared with $189,014 in 1922. Preferred dividends took $30,000 in each of these years, leaving a balance to profit and loss in 1923 of $139,469 compared with $159,014 in 1922.

## Bamberger Electric Makes Favorable Showing

The Bamberger Electric Railroad, Salt Lake City, Utah, came out on the credit side of the sheet in operation during 1923, according to the annual statement filed with the Public Utilities Commission recently by Julian Bamberger. The net operating revenue was $127,943 and the operating income $79,694.

The report shows that in 1923 the Bamberger Electric received $585,343 from operating revenues, which included a passenger revenue of $428,577. During the year the road increased its passenger revenue $7,154 over that of 1922.

Despite an increase in freight and passenger revenue during 1923, the Bamberger Electric showed a decrease of $36,072 in net revenue as compared with 1922, the additional expense being caused by an increase of $51,668 in operating expenses over the preceding year. The company paid $8,539 more taxes in 1923 than in 1922, which made the decrease of $44,611 in operating income under that of last year.

The total valuation of the road increased in 1923 over the preceding year by $47,595. In 1922 the balance was $4,155,589 as compared with $4,203,184 at the end of last year.

## Permissible Return Earned in New Orleans

The New Orleans Public Service, Inc., for the first time since its organization as the successor to the local at New Orleans, for the first three months this year earned a little more than the rate of return of 7.50 allowed, on a rate base of $53,628,449. It earned during that period a rate of return of 7.66 on earnings of $1,026,922 as against 7.48 on $990,595 for the similar period in 1923. It is not likely that the earnings will be maintained at the recent rate in the months that are to follow, for with the coming of hot weather and the closing of the schools and the exodus to the country and seaside a decline may be expected. Certainly the increase is too small to hold out any immediate prospect of a reduction in the price of gas, electric light and power and railway fares. However, the report shows that with better equipment the corporation has been able to increase its earnings, giving promise ultimately of a reduction of charges all along the line. The gross income of the corporation for the twelve months from March, 1923, to March, 1924, was $3,591,906, or a rate of return for the year of 6.91.

INCOME STATEMENT OF NEW ORLEANS PUBLIC SERVICE, INC.

| | Railway Department | | All Departments | |
|---|---|---|---|---|
| | Three Months | Twelve Months to March 31, 1924 | Three Months | Twelve Months to March 31, 1924 |
| Operating revenue | $1,882,068 | $7,567,255 | $4,014,885 | $14,688,031 |
| Operating expenses, including renewals and replacements reserve | 1,269,386 | 5,196,112 | 2,546,835 | 9,508,297 |
| Net operating revenue | 612,682 | 2,371,143 | 1,468,050 | 5,179,734 |
| Taxes and uncollectible consumers' accounts | 215,208 | 842,493 | 454,156 | 1,712,308 |
| Net operating income | 397,472 | 1,528,645 | 1,013,895 | 3,467,426 |
| Miscellaneous income | 5,166 | 22,544 | 13,028 | 124,480 |
| Gross corporate income | $402,639 | $1,501,189 | $1,026,923 | $3,591,906 |
| Income deductions | ......... | ......... | 563,991 | 2,214,957 |
| Balance available for sinking fund requirements, dividends and surplus reserve, in accordance with ordinance No. 6822, C.C.S. | ......... | ......... | $462,931 | $1,376,949 |
| Rate base | | | $53,628,449 | $53,447,368 |
| Per cent earned | | | 7.66 | 6.91 |

## Smaller Loss for New York Transit Lines for Quarter

Although the operations of electric railway companies in New York City for the quarter ended Sept. 30, 1923, resulted in a loss of $413,000, the improvement over the corresponding quarter of the previous year was $281,000. The rapid transit lines showed an improvement of $564,000, but failed, however, to meet all fixed charges during the quarter by $679,000. The showing made by the surface lines was not as good as in the same quarter of the previous year. Operating revenues fell off $270,000. Net corporate income for the current quarter amounted to $266,000 or $283,000 less than last year. The following comparative income statement made public recently by the New York Transit Commission summarizes the results of operation for the quarter, compared with the previous year:

| Item | Quarter Ended 1923 | Sept. 30 1922 |
|---|---|---|
| Passenger fares | $31,525,530 | $30,893,507 |
| Other operating revenues | 2,330,706 | 2,417,116 |
| Total street railway operating revenues | $33,856,236 | $33,310,623 |
| Street railway operating expenses | $23,902,817 | $23,770,802 |
| Street railway taxes | 1,945,574 | 2,019,379 |
| Income from street railway operations | $8,007,844 | $7,520,442 |
| Other income | 1,281,568 | 1,519,227 |
| Gross income | $9,289,415 | $9,039,669 |
| Fixed charges | 9,702,045 | 9,732,829 |
| Net corporate income or (*D*) loss | *D*$412,631 | *D*$693,160 |

The operating ratio on rapid transit lines decreased from 68.19 for the quarter ended Sept. 30, 1922, to 65.89 for the quarter ended Sept. 30, 1923, whereas on surface companies it increased from 75.24 to 76.74. For all companies the operating ratio decreased from 71.36 to 70.60.

## Cities Service Has Good Report

The report of the Cities Service Company, New York, for 1923, which has just been issued, shows a substantial increase in earnings over the preceding year. The gross earnings were $16,602 562, as compared with $14,658,971 in 1922, and net to stock was $13,468,760, as compared with $11,847,119. This was the equivalent, after the deduction of preferred dividends, to $18.28 a share earned on the average amount of common stock outstanding during the year. In 1922, $14.88 was earned on the common stock then outstanding.

Gross earnings of the Cities Service Company which came from public utility subsidiaries alone increased 35 per cent to $11,278,508 from $8,347,546 in 1922. In spite of the fact that the oil industry became demoralized because of the abnormal overproduction of crude oil, the gross earnings of the company's oil division showed a decline of less than $1,000,000, the amount for 1923 being $5,324,054, as compared with $6,311,425 in 1922.

The earnings from utility properties alone were not only sufficient to take care of all expenses, interest charges and the preferred dividend, but also provided a substantial balance for the common stock, all of the earnings from the oil operations of the company's subsidiaries being applicable to the common stock.

The company operates 372 miles of electric railway with 822 cars. It serves a population of 650,000 and in 1923 the railway lines carried 97,199,484 passengers.

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**Public Hearing on Valuation Petition.**—The State Corporation Commission has set May 6 as the date for a public hearing in Petersburg, Va., on the petition of the Virginia Railway & Power Company for a valuation for rate making purposes by the State Corporation Commission. The commission has set May 5, for a similar hearing in Richmond on a petition to value the Richmond property in the same way.

**Receivership Lifted.** — The Coney Island & Brooklyn Railroad, Brooklyn, N. Y., on April 1 resumed the operation of its lines, which had been in the hands of the receiver, Lindley M. Garrison. The lines controlled by this company are the Franklin Avenue, DeKalb Avenue and Smith Street lines of the Brooklyn-Manhattan Transit System.

**Securities Authorized in Reorganization.**—Another step in the reorganization of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, was completed recently when the Public Utilities Commission authorized the Cleveland & Southwestern Railway & Light Company to issue $8,500,000 of securities, of which $4,000,000 will be preferred stock, $400,000 common stock, and the remainder bonds.

**$4,439,664 Damages Claimed in Montreal.**—Rendition of account with damages of $4,439,664 from trustees and former directors of the Montreal Tramways & Power Company, Ltd., are asked by the new board in an action in which the writ was taken out recently. It is alleged that the affairs of the company have been mismanaged, and that the sum represented in the action has been lost. It is to recover this money that the claim has been laid.

**Surplus of $6,209.**—The revenue of the Eureka Street Railway, Eureka, Cal., in 1923 was $85,583. The net surplus for the year was $6,209. On the city lines 1,510,783 passengers were carried. This is a municipal line.

**Loss for Year $10,208.**—The Northwestern Pacific Railroad, San Francisco, Cal., reports to the Railroad Commission for the year 1923 that its operating revenue was $7,994,091 and operating expenses $5,908,323, giving a net operating revenue of $2,085,768. Interest, rent, taxes and other deductions totaled $2,274,074. The net corporate loss for the year was $10,208. The surplus at the beginning of the year amounted to $4,397,627. Miscellaneous additions to surplus for 1923 amounted to $13,487 and miscellaneous deductions were $93,492, leaving an accumulated surplus at the end of the year of $4,307,415.

**Surplus Shows Improvement.** — For the fiscal year ended Dec. 31, 1923, the Tygarts Valley Traction Company, Grafton, W. Va., earned $51,317. Operating expenses were $37,165 and net earnings $14,152. After the consideration of interest on funded debt, taxes and other items, the net gain for the year was $8,998. In 1922 the surplus was $7,940.

**Issue of $1,570,000 for Transit.**—The Rapid Transit Commission of Cincinnati, Ohio, recently directed a bond issue of $1,570,000 for the completion of the rapid transit. When this issue is made the original appropriation of $6,000,000 for the subway and rapid transit will be complete. The bonds bear interest at 5¾ per cent.

**Accumulated Deficit $557,881.**—The Union Traction Company, operating in Santa Cruz, reports to the California Railroad Commission for the year 1923 that its operating revenue was $73,059, and operating expenses $90,996, giving a net operating loss of $17,937. Interest, rent, taxes and other deductions totaled $35,485. The net corporate loss for the year was $52,926. The deficit at the beginning of the year amounted to $236,075. Miscellaneous additions to surplus for 1923 amounted to $339 and miscellaneous deductions were $249,219, leaving an accumulated deficit at the end of the year of $557,881.

**Net Revenue Increased.**—The electric railway properties of the Boston & Maine Railroad, namely, the Portsmouth Electric Railway and the Concord Electric Railways, operating in Portsmouth and Concord, N. H., realized a total revenue of $314,912 in 1923. This is compared with $332,786 for the year ended Dec. 31, 1922. The total operating expenses showed a falling off from $288,925 in 1922 to $263,645 for the year ended Dec. 31, 1923. The net revenue for 1923 was $51,267, against $43,861 in 1922.

**Poor Showing in Everett.**—According to reports filed by the Pacific Northwest Traction Company, Everett, Wash., and its subsidiary company, the Puget Sound International Railway & Power Company, the year 1923 was less profitable to these companies than the preceeding year. The Pacific Northwest Traction Company operates the electric interurban lines between Bellingham and Mount Vernon, a stage line between Mount Vernon and Everett and an electric line between Everett and Seattle. The Puget Sound International operates the Everett Street railway system. Its stock is all held by the Pacific Northwest. The net income transferred to profit and loss was $177,482, or $85,557 less than for 1922.

**City Loses Appeal Against Railway.**—The Pennsylvania Supreme Court on May 1 refused to allow the city of Philadelphia to appeal against the decision of the Superior Court in upholding the finding of the Public Service Commission in the Philadelphia Rapid Transit Company valuation case. Denial of the right to appeal was based on the city's failure to ask for that privilege within thirty days from the date of the Superior Court's order. The Superior Court sustained the Public Service Commission in finding that the valuation of the Philadelphia Rapid Transit property was more than $200,000,000, and in justifying the present rate of fare.

**Savin Rock Amusement Property Sold by Connecticut Company.**—The Connecticut Company, New Haven, on April 30, agreed to sell to Frederick Levere all of its holdings at Savin Rock, West Haven, for the sum of $350,000. The property includes a considerable strip of shore front, the railroad grove, the park and White City. The terms of the sale, it is understood, call for $50,000 down and the balance in ten years. The transaction must be indorsed by Federal authorities. According to Mr. Levere's attorney plans are being worked out to rejuvenate Savin Rock and bring large amusement enterprises to the shore.

**Gold Bonds Offered.**—A. B. Leach & Company, Inc., and P. W. Chapman & Company, Inc., New York, are offering at 99½ and accrued interest, to yield more than 7 per cent, $1,500,000 of the Durham Public Service Company, Durham, N. C., refunding mortgage 7 per cent gold bonds, series "A." The bonds are dated April, 1, 1924, and are due April 1, 1949. The proceeds of this issue of bonds will be used for the retirement of the company's outstanding general mortgage gold bonds and to reimburse the company for additions and betterments already made to the properties, and for other corporate purposes.

**$1,409 Loss for California Road.**—The Bakersfield & Kern Electric Railway, Bakersfield, Cal., reports to the Railroad Commission for the year 1923 that its operating revenue was $105,042; operating expenses $97,501, giving a net operating revenue of $7,541. Miscellaneous non-operating revenue amounted to $60. Interest, rent, taxes and other deductions totaled $9,010. The net corporate loss for the year was $1,409. The surplus at the beginning of the year amounted to $54,482.40. Miscellaneous additions to surplus for 1923 amounted to $45.34, leaving an accumulated surplus at the end of the year of $53,118. Bakersfield is a city of about 20,000 inhabitants.

**Railway Bonds Extended at Increased Interest.**—Drexel & Company, Philadelphia, and Bonbright & Company, Inc., New York, announced on April 26 that on May 1 they would buy at par and accrued interest the 5 per cent improvement mortgage bonds of the North Hudson County Railway. At the same time the Public Service Railway, Newark, successor to the North

Hudson County Railway, announced that it would extend these bonds so that they would mature on May 1, 1926, with interest at the rate of 6 per cent per annum, payable May 1 and Nov. 1. The present lien of the mortgage indenture securing the bonds will remain unimpaired for the principal and 5 per cent of the interest on the extended bonds, which will be guaranteed as to principal and interest, including the additional 1 per cent of interest, by indorsement by the Public Service Corporation of New Jersey.

**Net Revenue Shows Decrease.**—The report of the Tacoma Railway & Power Company, Tacoma, Wash., showed that railway operating revenues of the company for 1923 were $1,567,849, a decrease of $17,925 from the year before, while the railway operating expenses were $1,318,515, or $64,207 more than for the previous year. The net revenue of $249,334 was $82,183 less than for 1922. The traffic account showed 27,260,794 regular passengers carried, 468,175 revenue transfers and 2,801,893 free transfers, a total of 30,530,862 passengers, in addition to which there were 1,196,696 free rides to employees. The average fare received from revenue passengers was 5.481 cents, and considering all passengers, including free rides it was 4.978 cents.

**Wants to Operate Buses.**—The Washington & Rockville Railroad, of Montgomery County, Md. has made application to the Maryland Public Service Commission for permission to discontinue its service between the District of Columbia and Forest Glen, Md., and substitute bus service. In its application the company said that in 1923 the gross receipts were $26,578 and operating expenses and taxes totaled $23,033 without provision for depreciation or return upon investment. It further claims that there has been a further decrease in patronage this year and now the operating expenses and taxes are greater than the revenue. The petition said that if the discontinuance of the line would retard development the company would agree to run one-man safety cars until there is an improvement in conditions.

**Miami Beach Line Sold.**—In a recent review of its operations Fitkin & Company, New York, reports that since the first of the current year the firm has acquired a number of utility properties, among which is the Miami Beach Electric Company, which operates the street railway systems in Miami and Miami Beach, Fla.

**Accumulated Surplus $30,734.**—The Angels Flight Railway, operating in Los Angeles, reports to the California Railroad Commission for the year 1923 that its operating revenue was $39,780 and operating expenses $25,944. Interest, rent, taxes and other deductions totaled $3,875. The net corporate income for the year was $10,105. The surplus at the beginning of the year amounted to $28,429. The company declared dividends of $7,800 during the year, leaving an accumulated surplus at the end of the year of $30,734.

**Loss for Nevada County Line.**—The Nevada County Traction Company, Grass Valley, Cal., reports a net corporate loss for 1923 of $5,376.

# Book Reviews

### Car Lighting by Electricity

A practical treatise on the construction, operation, inspection and maintenance of the car lighting systems in use on American railway cars. By Charles W. T. Stuart, foreman of car lighting, Philadelphia terminal, Pennsylvania Railroad. Published by Simmons-Boardman Publishing Company, New York.

This book covers very completely the practical features of lighting systems for railway cars. These include the storage battery system, the various types of head-end turbo-generator systems, and the axle generator systems. The matter included is almost entirely descriptive, the aim being, as stated in the preface, to present the various phases of car lighting in a manner so that the principal worker in the field, the engineer, or the student, may find a comprehensive presentation of such phases of the subject as may have a direct interest for him, or that may, in a general way, assist in the betterment of the art of car lighting.

### EMF Electrical Year Book

Edited by Frank H. Bernhard and a staff of contributing editors. 1,672 pages, 9 x 12, illustrated. Published by Electrical Trade Publishing Company, Chicago, Ill.

The EMF Electrical Year Book, which is now issued for the third time, is according to the statement on the title page "An encylopedia of current information about the expanse of the electrical industry, with a dictionary of electrical terms, and a classified directory of electrical and related products, and their manufacturers in the United States and Canada." No departure has been made in this third edition from the original plan of the book. The manufacturers' company entries in the general alphabetical treatment of topics have been considerably condensed, and certain listings of manufacturers have been dropped. In the place of this material several hundred illustrations have been added throughout the book. The arrangement is entirely alphabetical, as in a cyclopedia, making the information readily available. Electric railway information accordingly is scattered throughout the book, although there is a short summary and statistical article on the subject.

### Mechanical Engineers' Handbook

Prepared by a staff of specialists. Lionel S. Marks, editor in chief, professor of mechanical engineering Harvard University. Second edition, revised; 2,000 pages, flexible, 4½ x 7. Published by McGraw-Hill Book Company, Inc., New York City.

This is the second edition of Marks Mechanical Engineers' Handbook. The first was published in June, 1916, since when it has run through eleven printings, with a total of 65,000 copies. The second edition has been thoroughly revised, and the material in every section has been brought up to date. Much new material also is included. The subjects which have undergone most change in this edition are: hydraulics, heat, iron and steel, non-ferrous metals and alloys, bearings, steam boilers, internal combustion engines, aeronautics, and air compressors.

As in the previous editions, the material is combined into fifteen main sections. Section 10, covering transportation, includes the subjects of automobiles, railway engineering, marine engineering, and aeronautics. Consideration of electric railway transportation as such has been entirely omitted, but the handbook contains much information and data of practical use to the electric railway mechanical engineer.

### Super-Power as An Aid to Progress

By Guy E. Tripp. The Knickerbocker Press, New York. 60 pp.

This book is a reprint of various articles and addresses by Mr. Tripp on the subject of super-power. They have been collected and form an interesting treatise on many of the social, economic and political aspects of the subject. Mr. Tripp attributes a large part of the progress in civilization during the last century to the increase in the amount of power under the control of man. This has permitted him to increase his production without a corresponding increase in his own labor. The corollary to this is that as power is made more abundant, more easily utilized and more available to more people, further progress will be made, and this in part is the purpose of the publication of these addresses.

### A Motorman's Message to You

By John Henry Boyce. Published by the author at South Bend, Ind. 23 pp.

The message is, briefly: Think, do the best you can, give service, avoid accidents, help sell transportation. The author, who has been in the train service of the Chicago, South Bend & Northern Indiana Railway since 1909, moralizes in a constructive way on these thoughts, and concludes with the warning: "You are the dispatcher of your own career over the railroad of time, and you can either clear the tracks to the City of Success, or you can wreck your career in the Valley of Defeat." It would be well if there was wider acceptance of the kind of philosophy contained in this little book.

### Handbook on Fire Protection

Compiled and published by Western Actuarial Bureau (Fire), Chicago, Ill.

This handbook, which is published in loose-leaf form, has been prepared to cover safe practices in building construction. Nine general sections are included, covering classification of buildings, walls, protection of openings in fire walls, protection of openings in exterior walls, floors and roof and supports, floor openings, roof openings, courts, exterior attachments. Diagrams and descriptive matter are included to illustrate safe practice.

It is proposed to add sections to the book from time to time. Some of the special sections proposed are on electric railway car houses and cars, to be considered at the National Fire Protection Association convention this month.

# Personal Items

## Mr. Spencer in New Office

### Toronto Municipal Railway Official Advanced to Post of Assistant to the General Manager

A. T. Spencer, engineer of way of the Toronto Transportation Commission, Toronto, Ont., operating the municipal electric railway there, has been appointed assistant to the general manager of the commission, D. W. Harvey. Temporarily, at least, no successor to Mr. Spencer as engineer of way will be appointed, and he will continue to supervise the operations of the way department.

A. T. Spencer

Mr. Spencer has had full charge of the commission's heavy program of track rehabilitation and extension. This has, indeed, been a big job. He has rebuilt all but 50 miles of track and has improved the lines formerly operated privately and tied them in with the old so-called Civic lines. It is not derogatory to the Toronto Railway to say that the lines which the city took over on the acquisition of the property were in bad physical shape. This was well known then. It is certainly well known now.

Mr. Spencer was appointed to the important position of engineer of way of the Toronto Transportation Commission in May, 1921, in anticipation of the extensive rehabilitation program which began when the commission took over the local lines the following September. This work might have been proceeded with in a leisurely manner, but the idea of leisure in rehabilitating the property of the Toronto Railway did not enter into the thought of the Toronto Transportation Commission. The city had suffered too long from bad tracks, poor cars and other inconveniences to be at all tolerant of any program which countenanced dallying with the work in hand.

Consequently, quantity production methods had to be worked out for the reconstruction of nearly 200 miles of track, and the proposition was handled so well under the direction of Mr. Spencer that all of the work was done during the past two seasons, and this year's program will be quite small. In order to carry out this work successfully in the very short space of time in which Mr. Spencer accomplished it, he had to resort to many novel methods and to exercise a great deal of ingenuity. The story of his resourcefulness in this direction was written without his knowledge in an article which appeared in the ELECTRIC RAILWAY JOURNAL for April 1, 1922.

Mr. Spencer brought to the work which he did at Toronto a fund of information gained while serving with other railways and while engaged in other similar lines of work. For a few months prior to his appointment under the Toronto Transportation Commission in May, 1921, he acted as assistant engineer in the railways department of the Hydro-Electric Power Commission of Ontario. Before that he had been connected with the Montreal Tramways, first as assistant engineer in charge of maintenance of way, and later as chief engineer of this department. Previous to that, he was employed by the Canadian Pacific Railway on grade revision in New Brunswick, Quebec and Ontario. In 1907 he was appointed assistant engineer of the Montreal Park & Island Electric Railway, and it was from this company that he went to the Montreal Tramways.

Mr. Spencer entered upon his engineering career in 1901 with the Dominion Coal Company and the Sydney & Louisburg Railway. He was born in Nova Scotia, and there received his general and technical education. In all the work that he has done, Mr. Spencer has shown a remarkable capacity for carrying out the job efficiently.

## Mr. Cann, Toledo Commissioner, Enters Bus Field

Wilfred E. Cann, who has been Street Railway Commissioner at Toledo since the beginning of service-at-cost operation under the Milner ordinance, has resigned, effective June 1, or sooner if convenient. The notice of resignation was sent to Mayor Brough and the board of control on May 3.

Mr. Cann was appointed by former Mayor Schreiber and took office on Feb. 1, 1921. Before going to Toledo he was assistant to the general manager of the Detroit United Lines in Detroit. He had charge of interurban properties of the company for several years.

He announced at Toledo that he has accepted an advantageous offer from the Brockway Corporation, Cortland, N. Y., in charge of the engineering department. This company makes a complete line of gasoline motor bus chassis in three models and a line of trackless trolleys made in two distinctive models. It is said that Mr. Cann expects to maintain a residence at Toledo for a year and may arrange to have his office in some Middle Western city.

In a letter to the Mayor Mr. Cann said:

> The pleasant associations I have enjoyed in Toledo, my firm belief in the service-at-cost plan of operation and a sincere desire to see Toledo's transportation system established on an efficient basis are factors that have made it extremely difficult for me to arrive at my present decision. I am deeply grateful to the members of the board for their kindly assistance and support. If at any time I can be of service to the city I trust you will feel free to call upon me.

## J. M. Stoddard Promoted to General Manager

John M. Stoddard, for the last twelve years superintendent and assistant to general manager of the Long Island Electric Railway and the New York & Long Island Traction Company, Jamaica, L. I., has been appointed general manager of the former company, succeeding Gen. Lincoln C. Andrews, who was recently appointed co-receiver with E. J. Ashmead of the New York & Long Island Traction Company.

J. M. Stoddard

Mr. Stoddard entered the railway field in 1894 as ticket agent and telegraph operator of the Grand Trunk Railroad. Eight years later he was appointed train dispatcher for the Rapid Railway, which operated between Detroit and Port Huron. Next Mr. Stoddard became connected with the Public Service Railway, Newark, N. J., in 1904 as an assistant division superintendent. He resigned this position in 1905 to become connected with the Brooklyn Rapid Transit Company, Brooklyn, N. Y., where he served in the capacity of dispatcher, assistant trainmaster and supervisor of inspectors. In 1910 Mr. Stoddard entered the employ of the New York & Long Island Traction Company as chief of the timekeeping and mileage department. His untiring devotion to the job, coupled with his natural ability, won for him the position of superintendent of that company as well as the Long Island Electric Railway, succeeding in that position I. B. Clarke, resigned.

R. L. Weber, chief electrical engineer of the Kansas City Railways, Kansas City, Mo., has gone to Boston to take up his duties as engineer in the electrical division of Stone & Webster.

## H. H. Porter Made President of Brooklyn City Railroad

H. Hobart Porter, a vice-president of the road, was on May 6 made president of the Brooklyn City Railroad to succeed Frank Lyman, advanced to the new office of chairman of the board. Clinton E. Morgan, general manager of the company since 1921 and vice-president and general manager since November, 1922, continues in these capacities in full charge of operation.

Lindley M. Garrison, receiver for the old Brooklyn Rapid Transit Company, appointed Mr. Porter in 1920 as director of operations of the surface lines of that company in addition to the Brooklyn City Railroad, of which he was then the operating chief. Under that arrangement he was responsible for the operation of the line of the Nassau Electric Railway, the Brooklyn, Queens & Suburban Railroad and the Coney Island & Brooklyn Railroad.

Mr. Porter is a member of the firm of Sanderson & Porter. In addition to his connection with the Brooklyn City Railroad he is president and director of the American Water Works & Electric Company, president and a director of the Brooklyn City Development Corporation, vice-president and a director of the James Mills Orchards Corporation, director of the National Surety Company, director of the Plattsburgh Traction Company, vice-president and director of the Queens Borough Gas & Electric Company and a director in the Washington Water Power Company, the West Penn Company, the West Penn Power Company, the West Penn Railways and the West Pennsylvania-Monongahela Company.

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**Major Philip Mathews**, United States Army, retired, has been appointed chief executive officer of the New York Transit Commission, effective May 15. Major Mathews succeeds in this capacity Gen. Lincoln C. Andrews, who resigned about a year ago. He is a graduate of West Point. He went to France in February, 1918, and was chief of staff for the Eighty-third Division. From 1921 to 1923 he served as assistant to Col. Haskell, director of American Relief in Russia, being in charge of railway transportation. This appointment is a step in the reorganization of the commission in accord with the passage of the Adler bill creating the new City Board of Transportation.

## Obituary

**Frank G. Ewald**, chief engineer of the Illinois Commerce Commission, died on April 27 in Evanston.

**Franklin J. Spaulding**, insurance manager for the Brooklyn-Manhattan Transit Corporation, successor to the Brooklyn Rapid Transit Company, died on May 1. He was born in Springville, Erie County, N. Y., and went to Brooklyn in 1895. The same year he entered the employ of the Brooklyn Rapid Transit Company. He was the originator of the idea of the insurance reserve fund and was made manager for the trustees of that fund.

# Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

## Steady Business Conditions Indicated

### Orders for Materials Handling Equipment Reflect This—Comments of Electric Railway Executives from All Parts of the Country Give Same Indication

THE manufacturer of materials handling equipment has an unusual opportunity to be informed on business conditions generally, for his product goes into practically every industry. Speaking to a representative of the McGraw-Hill Company, Inc., on last Monday, Charles Piez, president Link Belt Company, with plants in Chicago, Philadelphia, Indianapolis and on the Pacific Coast, and offices in the principal industrial centers, summarized the status of that company's business.

"Our plants as a whole," said Mr. Piez, "are running at 85 per cent of their normal forty-eight hours per week capacity. The Philadelphia plant in January, February and March did not show up so well, but there has been a large increase in orders and production in April and we look for a continued upward trend in the Eastern territory. For the Middle Western plants business has been brisk, and the same applies, but in increasing measure, for the Coast plant and office.

"Such hesitation as exists on the part of buyers is due, so the buyers themselves state, to the disturbance of the forthcoming election and the Washington political situation. Financial and business conditions of the country generally, however, are sound and stable."

At a recent meeting of the American Electric Railway Association executive committee, whose membership hails from all parts of the country, each executive was asked as to the trend of riding and business conditions in general in his community. In some cities riding was off slightly and in others it was better than the corresponding month last year. Most of those executives from cities where the riding was off slightly in March attributed it to the late spring and the fact that Easter this year came in April instead of March, which brought the Easter shopping riding a little later this year than last. There was no distinctive indication of any change in business upward or downward and the impression gathered was that conditions generally are steady. These indications tend to show that, while there is some falling off in certain lines, the talk about a general slowing up of business is largely psychological and the reflection of the pessimistic mind.

### Metal, Coal and Material Prices

| Metals—New York | May 6, 1924 |
|---|---|
| Copper, electrolytic, cents per lb. | 13.312 |
| Copper wire base, cents per lb. | 15.625 |
| Lead, cents per lb. | 7.65 |
| Zinc, cents per lb. | 6.15 |
| Tin, Straits, cents per lb. | 47.50 |
| **Bituminous Coal, f.o.b. Mines** | |
| Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons | $4.425 |
| Somerset mine run, Boston, net tons | 2.325 |
| Pittsburgh mine run, Pittsburgh, net tons. | 1.875 |
| Franklin, Ill., screenings, Chicago, net tons | 2.175 |
| Central, Ill., screenings, Chicago, net tons. | 1.90 |
| Kansas screenings, Kansas City, net tons. | 2.50 |
| **Materials** | |
| Rubber-covered wire, N. Y., No. 14, per 1,000 ft. | $6.50 |
| Weatherproof wire base, N.Y., cents per lb. | 17.50 |
| Cement, Chicago net prices, without bags. | $2.20 |
| Linseed oil (5-bbl. lots) N. Y., per gal. | $0.97 |
| White lead, in oil (100-lb. keg), N. Y., cents per lb., carload lots. | 12.25 |
| Turpentine, (bbl. lots), N. Y., per gal. | $0.925 |

## Key System Transit Spends $18,000 on New Motors

As the beginning of a policy of modernization of its rolling stock, it is reported that the Key System Transit Company, Oakland, Cal., will soon be in the market for new cars.

In line with the same policy the company has recently ordered twelve new GE-240 motors from the General Electric Company to be installed in some of its center-door cars of the type used in service to the Oakland ferry.

These motors will replace GE-66 motors and will cost $18,000.

An order has been placed for six new double-end air equipments, consisting of D.H.-25 motor-driven air compressors with three-point suspension, compressor governors and M-24-A brake valves. The total cost of new control equipment recently ordered by the Key System for installation at Oakland is set at $11,700 and of the air equipment $5,508.

## New Company Organized to Make Lumnite Cement

The Atlas Aluminate Cement Company has been formed, with offices at 25 Broadway, New York City, to manufacture high alumina cement. For some time an increasing interest on the part of engineers has been shown in the French high alumina cements, which have at the end of twenty-four hours a greater strength than that of portland cement at twenty-eight days, and resistance to the chemical attack of sea water and sulphate bearing ground water. Although more expensive than other cements in first cost, because it is manufactured from raw materials consisting largely of high grade aluminum ore, the exceptional characteristics of this cement have developed in Europe a substantial market for the product. For this reason the Atlas company was formed to acquire the so-called Spackman patents; which cover the manufacture of all high alumina cement in the United States. After several months' experiment the company is now prepared to produce "Lumnite" cement at its factory at Northampton, Pa., in ample quantities to meet any demand.

The special qualities of "Lumnite" cement are said to make it particularly valuable in railway construction and maintenance. Reconstruction or repair of concrete work may be made one day and put in service the next with a minimum of interference with traffic, shop work and use of terminals, yards and carhouses.

Lumnite cement is essentially aluminous. Its chemical composition in round numbers is as follows:

| | Per Cent |
|---|---|
| Silica, magnesia, insoluble, loss, etc. | 5 |
| Alumina ($Al_2O_3$) | 40 |
| Lime (CaO) | 40 |
| Iron oxides | 15 |

## Western Advertising Concerns Pass to Collier

The Western Advertising Company, which controls the advertising space in the street cars of St. Louis and St. Louis County and one of the largest concerns of its kind in the country, and the Ewing Hill Company, which holds car advertising contracts in southern Illinois, have been purchased by Barron Collier, New York City. The Western and the Ewing Hill companies, allied organizations, have offices in the Merchants-Laclede Building, St. Louis. The purchaser will assume the management of the local offices on June 1.

The Western Advertising Company was organized by Ewing Hill in 1886. Daniel A. Hill, Webster Groves, Mo., president of the Western, will continue with the new management either in St. Louis or New York City, but his brother Ewing Hill, vice-president of the Western and president of the Ewing Hill Company, will retire. Mr. Collier was a vice-president of the Ewing Hill Company. Bruce Dougan is second vice-president of the Western and G. M. McGunnegle secretary-treasurer. Other officers of the Ewing Hill Company are: J. B. Lackey, New York, secretary, and Daniel A. Hill, treasurer.

## *Rolling Stock*

**Pittsburgh Railways, Pittsburgh, Pa.,** has placed orders for 225 cars in three different lots, 100 multiple-unit, semi-steel, center-entrance cars with the Pressed Steel Car Company, 60 multiple-unit, semi-steel, center-entrance cars with the Standard Steel Car Company and 65 one-man, two-man cars from the Standard Steel Car Company. The cars are almost identical with respect to their specifications. The seating capacity of all will be the same, namely, fifty. The one-man, two-man cars, however, will weigh 35,000 lb., compared with 36,000 lb. for the others. These cars also will be equipped with K-43 G2 control and Van Dorn couplers. The general dimensions of the cars will be identical. The specifications for the 160 m.u. cars, of which the other 65 will be duplicates, except for the differences already noted, are as follows:

| | |
|---|---|
| Date of order | March 24 and April 22 |
| Date of delivery | Beginning August |
| Seating capacity | 50 |
| Total weight | 36,000 lb. |
| Bolster centers, length | 21 ft. 6 in. |
| Length over all | 45 ft. 0 in. |
| Truck wheelbase | 5 ft. 6 in. |
| Width over all | 8 ft. 2 in. |
| Height, rail to trolley base | 10 ft. 4 in. |
| Body | Semi-steel |
| Interior trim | Cherry |
| Headlining | Haskelite, white enameled |
| Roof | Monitor |
| Air brakes | Not yet decided |
| Armature bearings | Plain |
| Axles | A.E.R.E.A. Standard |
| Bumpers | Hedley anti-climber |
| Car signal system | Not yet decided |
| Car trimmings | Not yet decided |
| Side bearings | Stucki |
| Control | Westinghouse remote switch |
| Couplers | Not yet decided |
| Curtain fixtures | Not yet decided |
| Curtain material | Not yet decided |
| Designation signs | Pittsburgh standard |
| Door-operating mechanism, | Pittsburgh standard |
| Fare boxes | Cleveland |
| Fenders or wheelguards | Not yet decided |
| Gears and pinions | Nuttal helical |
| Hand brakes | Peacock staffless |
| Heater equipment | Consolidated |
| Headlights | Not yet decided |
| Journal bearings | Plain |
| Journal boxes, | Symington A.E.R.E.A. Standard |
| Lightning arresters | K-3 condenser |
| Motors | Westinghouse 514-P, inside hung |
| Paint | Chrome orange |
| Registers | International R7 |
| Sanders | Nichols-Lintern |
| Sash fixtures | Not yet decided |
| Seats | Cross and longitudinal |
| Seating material | Rattan |
| Slack adjuster | Pittsburgh Railways |
| Springs | Not yet decided |
| Step treads | Feralun |
| Trolley catchers or retrievers. | Not yet decided |
| Trolley base | Nuttall 13-E |
| Trolley wheels | 6-in. diameter |
| Trucks | Arch bar |
| Ventilators | Perry and Peerless |
| Wheels | Rolled steel 26-in. |

**New Orleans Public Service, Inc., New Orleans, La.,** has announced the specifications for fifty-five new cars. These cars are very similar to the 900 type of the company, of which twelve are now in operation and six more are on order from Perley A. Thomas. They differ only slightly from the 800 type, of which seventy-five were built by Brill and twenty-five by Thomas. They are designed along lines similar to the 400 type, but are heavier and stronger, with the idea possibly of using them to haul trail cars at some future date. The steel posts on the light-weight 400 type have been replaced by wood posts on the platforms and wood-filled tee-posts between the windows. The detailed specifications follow:

| | |
|---|---|
| Type of car, | Double-end double-truck passenger |
| Seating capacity | 52 |
| Bolster centers, length | 22 ft. 5¾ in. |
| Length over all | 47 ft. 8 in. |
| Truck wheelbase | 4 ft. 10 in. |
| Width over all | 8 ft. 7 in. |
| Height, rail to trolley base | 11 ft. 5¾ in. |
| Body | Copper bearing steel |
| Interior trim | Cherry |
| Headlining | Agasote |
| Roof | Arch |
| Air brakes | 25 Westinghouse and 30 G.E. |
| Car signal system | Faraday |
| Car trimmings | Bronze |
| Control | K-68A |
| Curtain fixtures | Forsyth |
| Curtain material | Pantasote |
| Destination signs | Keystone |
| Door-operating mechanism, | National Pneumatic |
| Wheelguards | H. B. Lifeguards |
| Hand brakes | Peacock staffless |
| Headlights | Crouse-Hinds |
| Journal bearings | Bronze, lead-lined |
| Journal boxes | M.C.B. standard 4¼x8 in. |
| Lightning arresters | Aluminum cell |
| Motors, | 60 G.E. No. 263; 50 Westinghouse No. 306 |
| Registers | International, hand operated |
| Sanders | Nichols-Lintern |
| Sash fixtures | O. M. Edwards |
| Seats | Hale & Kilburn |
| Seating material | Wood, slat |
| Slack adjuster | American Brake |
| Step treads | American Abrasive Metals |
| Trolley catchers | Ohio Brass |
| Trolley base | Ohio Brass |
| Trucks | Brill 76-E2 |
| Ventilators | Railway Utility honeycomb |
| Wheels | 33 in., cast iron |

**El Paso Electric Railway, El Paso, Tex.,** has appropriated $50,000 for the purchase of seven new cars of the Birney one-man type.

**Key System Transit Company, Oakland, Cal.,** it is reported, will be in the market soon for new rolling stock.

**Indianapolis Street Railway, Indianapolis, Ind.,** will purchase twenty-five modern cars. The amount estimated to purchase the cars is put at $315,000.

**New Orleans Public Service, Inc., New Orleans, La.,** is contemplating the purchase of additional cars of the type described elsewhere in this issue. The experimental car recently completed was built in the company's shops, but it is planned to purchase other cars of this type from car builders.

**Detroit Department of Street Railways, Detroit, Mich.,** awarded the contract on bids opened April 8 to the McGuire-Cummings Manufacturing Company for furnishing fifty Peter Witt type car bodies at $8,665 each. Contract was also awarded the General Electric Company for furnishing fifty electric equipments at $3,388 each. The contract for trucks for the above cars was not awarded. Bids were asked on 100 complete outfits, but it was decided to order only fifty at this time and possibly order fifty more later.

## *Track and Line*

**Sacramento, Cal.**—A contract will probably be let within the next few days for the construction of the new union electric terminal in Sacramento. Bids were opened by J. B. Rowray of the Sacramento Northern on April 24. They are on a 100-ft. x 58-ft., three-story building. In addition to the material that will be used in the structure itself a considerable amount will be expended for cross-overs and other special work included in the terminal plan.

## *Trade Notes*

**American Insulating Machinery Company, Philadelphia, Pa.,** has brought out a new signal based on familiar principles but embodying certain novel features. The main changes consist in the simplification of the apparatus, a reduction in weight placed on the poles, the elimination of bone studs and the substitution of micarta for certain metal parts.

**International Steel Tie Company, Cleveland, Ohio,** reports prospects for business this year are excellent. The company is now shipping ties for 7 miles of track to the Havana Electric Railway, Havana, Cuba. This construction consists of 5 miles of new track and 2 miles of rebuilt track. Another recent shipment is for 4 miles of track at Portland, Ore. Another lot of ties sent to San Diego, Cal., will complete 28 miles of track which that company now has laid with International ties.

New York, May 17, 1924

# Electric Railway Journal

*Consolidation of Street Railway Journal and Electric Railway Review*

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Henry W. Blake and Harry L. Brown, *Editors*

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*Number 20*

## Causes of Hot Bearings Studied

IN AN analysis recently made by a superintendent of equipment of a large railway system of causes which contribute largely to hot bearings several interesting points were brought out. The most serious causes were mechanical defects, such as excessively worn fits between the bearings and their housings and also between the housings and the motor frame. In some cases in taking up this wear by canvas shims, the thin bronze shells of the bearings had been forced inward, so as to clamp the axle too tightly. The introduction of mud or dust into the bearing housings, while the covers were open for lubrication, was shown to be another source of trouble. Loose, lost or badly fitted covers also permitted the entrance of dust and water while the cars were in service.

Other causes for hot bearings included broken babbitt, bearings turning in their housings, dust collars missing and check plates broken.

On many railways the lubrication of bearings is done by night forces, and as the clearance between the motors and the car framing is small, where cars are not provided with trapdoors the oiler must reach overhead and pour his oil blindly into an opening which he knows exists. Under such conditions dirt and mud are almost sure to fall into the housing, and in time this will filter through the waste and grind out the bearings and shafts.

It is thus seen that lubrication of motor bearings includes much besides the proper choice of a lubricant and the decision as to the amount to be used. An extensive study of the amounts of oil used, period of oiling and number of hot bearings on 57 railways is presented in this issue. A very valuable article by Mr. Bethel on packing bearings was published in this paper April 19, 1924.

## Old Goods in a New Package

IF YOU walk through the shops of the street railway company in a certain large and rapidly growing city, you will see a number of ancient cars being completely rebuilt.

"When we get through," said the master mechanic proudly, "we will have practically a new car."

So far as material goes, his statement is true. Almost the only part of the old car which is being retained is the monitor deck roof. New side posts, new sills, new floor, new platforms, new sheathing, and new equipment are being used. Physically the rebuilt car will indeed be "practically a new car."

But, in spite of all that, it will not be a really new car. It will not look like a new car. It will have an old-fashioned and inconvenient arrangement of seats, doors and steps. The excess weight so commonly found in obsolete types of cars will be retained in this rebuilt vehicle. The symmetry of line, which is a noteworthy feature of many modern cars, will be lacking. In fact, the very portion of the old car which is being so carefully preserved, the monitor deck roof, is one of its least attractive features.

On paper this railway can show that the immediate expenditure is less than would be required to purchase an equivalent amount of new rolling stock. But it is extremely doubtful whether this capital saving is enough to pay for hauling the excess weight over the road day after day. The fact seems to have been overlooked that under the guise of economy, the railway is offering the public old goods in a new package. No such policy can succeed for long.

The public likes to ride in modern street cars. The fact that a car has new window posts, new sills, new running gear, etc., has no special appeal to the passengers. If the vehicle has the lines of an old car, it is an old car in their eyes. That being the case, it would be a much sounder policy to invest money in really new cars that will have a definite merchandising value and reduce operating expenses, than to put even a smaller amount of money into vehicles which can never be really modern in appearance or design, or satisfactory to the patrons.

## Making the Stores System Serve the Men, Not the Men the Stores

MOST electric railway shop foremen realize that the efficient handling of materials used in maintenance work has much to do with shop efficiency. Few, however, can point to definite savings that have been accomplished by rearrangement of the supply system to assure that materials will be ready when needed and close at hand. One master mechanic, however, claims to have increased the output in truck overhauling 25 per cent by close attention to materials needed for replacement, such as bolts, nuts, rivets, truck brake levers, brake shoes, hangers, wheels, gears, etc.

A space immediately adjacent to the truck overhauling department has been arranged for the systematic storage of small quantities of the material needed in truck overhauling. By having this near the work much time is saved in getting parts, and by having the storage systematically arranged the various parts needed can be found quickly when required and without the long waiting often involved at the central store room.

Previous to the inauguration of this system the men

**This is the issue in May that is devoted essentially to maintenance subjects**

lost considerable time in going to and from the general shop supply room to get replacement parts. It was also necessary often to issue rush orders to other departments. New brake hangers were required and the forge shop had to supply them immediately; welding repairs were needed for various truck parts and the work was rushed through the welding department. By providing a few spare parts such as are needed most frequently this class of rush work has been done away with. When used, they are replenished from the central store room, and drawing the stock from the central store room for the unit store room serves notice on the storekeeper to replenish his stock, in advance of the actual need for it by the overhauling unit.

As soon as possible after trucks have been removed from cars and placed in the overhauling shop, the foreman or assistant foreman makes an inspection of the equipment and lists parts that need replacement or require work of other departments. This list is handed to the man designated to see that the repair parts needed are kept on hand in the truck repair storage. The overhauling crews are instructed as to parts that should be replaced and other special work that must be done in addition to the regular cleaning and overhauling.

By this systematic procedure, substantial economies have resulted and the morale of the shop forces has been increased as the men are relieved of chasing up material and can concentrate their effort entirely on truck overhaul.

Space for overhauling repairs in most electric railway shops is at a premium and shop efficiency on a man-hour basis is exceedingly low, but by some small changes in storage and requisition methods economies are possible.

## Public Sentiment Prevails in Pittsburgh Strike

THE strike of the Pittsburgh Railways trainmen over last week-end was quickly settled in the court of public opinion. Sentiment was overwhelmingly against the demands of the men for substantial wage increases. This, coupled with very prompt and decisive action on the part of the Mayor to protect the property of the railway at all costs, soon made union officials and men realize that the strike was a miserable failure. So they voted to go back to work on an offer of the company to pay the same wages and in addition half the cost of one uniform during the two years covered by the agreement, which means that the company will contribute about $14.25 per man above his wages during the contract.

The Pittsburgh management is to be congratulated on its positive though kindly stand toward this wage proposal. Not only has the outcome been of value to the industry, but it will make it possible for the Pittsburgh company to work itself into a secure position, insuring a high grade of service to local people. The public seemed to understand the gravity of a wage increase at this time, and having been shown by the plain facts that the street car men's wages were not out of line with those in comparable lines of work, and were among the very highest in the street railway field, its disapproval of the proposal was plainly manifested.

Of course, it is rather natural to try the metal of a new management, but there is not likely soon to occur another strike in Pittsburgh unless the position of the men is altogether more tenable than on this occasion. The men now know that while being considerate and sympathetic of their views, the present management can also be firm and final when it says that an increase in wages is not financially possible.

## Transportation vs. Paving

THE petition of Gen. Lincoln C. Andrews, receiver for the New York & Queens County Railway, requesting permission of the New York Supreme Court to cease operation and surrender the railway's franchise brings into bold relief the inequitableness of requiring a railway to pay for paving in the track zone. Here is a company whose gross revenue for the current year will be about $650,000, and it is now ordered by the Hylan Administration of New York City to assume a paving expense in 1924 of $340,000. The company is in receivership and is located in a territory poor from a transportation point of view. While serving 40,000 passengers a day, the 5-cent fare imposed by the dictates of the same city government, and the conditions of the traffic are such that it would only be by the most careful management and removal of all unnecessary obligations that the railway could possibly be made to pay its way.

As a matter of fact, since the present receiver took charge, a little over a year ago, an operating deficit of some $30,000 a year has been turned into an apparent net of about the same amount. This $60,000 increase, nearly 10 per cent of the gross revenue, under conditions existing on the property, is an achievement worthy of praise, as it has been due to the progressiveness of the management and the introduction of sensible economies. The improved financial condition has made it possible to continue giving trolley service in a section where no other transportation facilities are available.

But all the recognition the city has given for this effort is as noted—a proposed paving assessment of $340,000, or over 50 per cent of the year's gross. The impossibility of paying such a charge is evident. If the company continues operation and the work is started the cost will become a lien against the property and will wipe out the remaining equity of the bondholders. Under the circumstances General Andrews had no other course than to apply to the courts to shut down in order to protect the bondholders' equity as far as possible. Incidentally this petition may serve so to arouse the community that measures of relief may be demanded of the city administration so that transportation can be continued.

But regardless of the outcome, this case is an object lesson—perhaps to railway managements as well as to city officials. It warns managements that no stone should be left unturned to make impossible a cessation of service for a reason such as this. The old franchises that contain clauses permitting city officials to continue imposing heavy paving burdens can be corrected if the people of the community are sufficiently enlightened as to the facts. A good many companies have succeeded in getting relief from the paving burden in the last two years. As to the lesson for city officials, if the Queens line is forced to shut down the incident should serve to show that it is impossible to get blood out of a turnip—that the traction corporation is really unable to pay for anything except in so far as the revenue from riders makes such payments possible.

# Lubricating Practice for Electric Cars

### An Analysis of the Quantity of Lubricant Used, the Period of Oiling, and Methods of Applying the Lubricants as Found from a Study Covering 57 Electric Railway Properties

MANY things contribute to faulty lubrication besides the amount and quality of the oil used. Bearings differ in material and clearances; wear throws the axles out of alignment; temperature influences the rate of flow of the lubricant; bad track conditions produce hammer blows that affect the efficiency of the bearings; dirt becomes mixed with the lubricant and stops its flow; the waste used for packing becomes glazed, falls away from the axle, or fails to conduct the required quantity of oil, and there are a score of other conditions that could be enumerated which result in overheating of bearings and damage to the equipment.

The lubrication problem is thus not confined to a choice of oil and grease and to the best methods of applying them, but if a serious study of operating conditions is made and an efficient organization is used for handling and applying the lubricant, much will be accomplished in keeping bearing troubles down.

In order to obtain information which would show the various lubrication methods employed, the inspection period and quantity of lubricant used and the results obtained, the editors of this paper have gathered information during the past 12 months from 57 electric railways varying in size from a road operating 18 cars to one operating 3,592 cars. The total cars reported on was 31,543. This information has been analyzed and the results are given herewith. Additional information has been obtained from lubricating engineers as to conditions which they have found on various electric railway properties and improvements that have produced beneficial results.

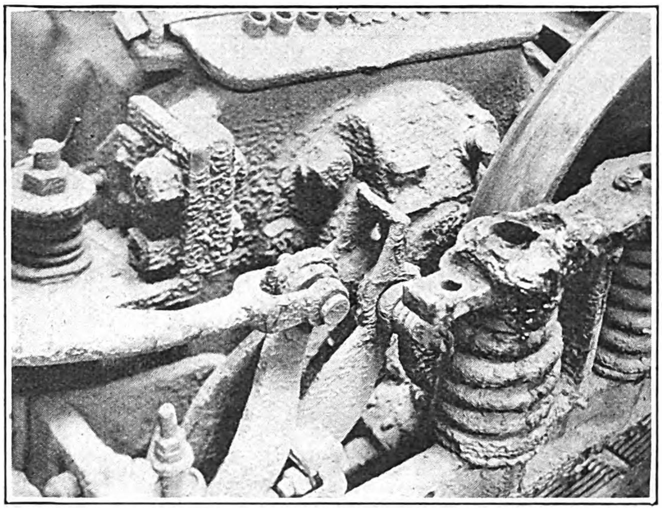
## LENGTH OF THE OILING PERIOD

The parts which determine the shortest inspection period are the armature, axle and journal bearings. Information was obtained as to the different bases used for inspection and oiling. Of the 57 replies received, 31 companies use the mileage basis for the majority of their lubrication; 24 companies use a time basis, and two companies use a car-hour basis. On many of the railways a combination of both mileage and time basis is used. In this case a definite basis, either mileage or time, is established for the important parts of the equipment, and the other parts are lubricated on a basis which works in conveniently with this.

In recent years, several railways have been inspecting and oiling cars on a kilowatt-hour basis, but as it happens, none of the 57 roads covered in this survey had taken up this latest basis.

The basis for oiling armature and axle bearings is the same on nearly all railways, and where a mileage basis is used, the most common unit is every 1,000 miles. Table I, on page 764, shows the units used for inspection and oiling and the number of railways which reported using each plan. Of the 31 railways which reported using a mileage basis, sixteen inspect their equipment every 1,000 miles. The next highest number using a definite mileage was three companies which inspect every 1,200 miles.

Where the time basis is used, inspection periods of one week are the most common. Of the 24 companies reporting as using the time basis, seven companies inspect every seven days, four every 14 days, and three reported using periods of 10 and 30 days. The two companies which reported using a car-hour basis inspect every 110 car-hours and every 200 car-hours respectively.



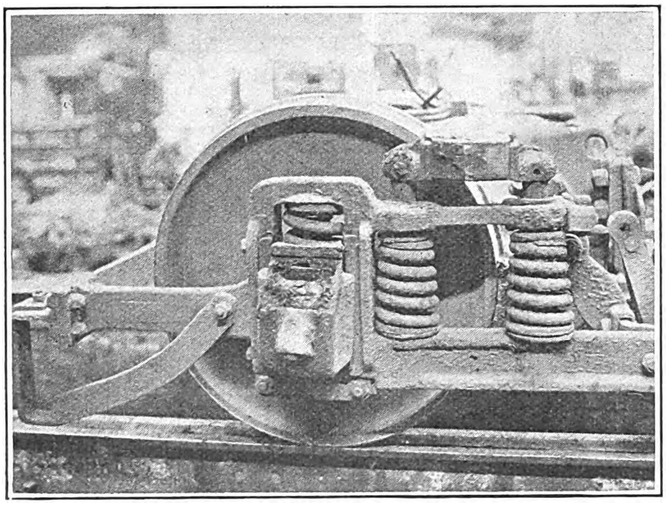
Motor Housings Are Exposed to Wheel-Wash and with Covers Encased in Mud It Is Almost Impossible to Keep Grit Out of Oil Chambers

Aside from armature and axle bearings, the other parts which are lubricated have a much larger variation in the lubricating basis used. Thus, from the replies received it is evident that the truck journal bearings require less attention than the armature and axle bearings, and where a time basis is used, a number of railways give attention to such journal bearings only on every other inspection period. Thus, where a weekly inspection basis is used, the journal bearings are given attention only every two weeks, and where the two-week inspection period is used, only once a month.

An analysis of the period used for oiling other parts shows that after the shortest unit for the inspection period has been determined, the most common practice is to use some multiple of this for lubricating other parts. In checking over the information gathered, it appears that journal bearings, motorman's valves, controller fingers and trolley wheels are most frequently oiled on the same basis as armature and axle bearings. The parts which are most frequently lubricated at every other inspection period are gears, compressors and side bearings. At approximately every fifth inspection period attention is given to controller cylinders and door engines, while parts that require the least lubricating attention, such as center plates and brake cylinders of cars, are given attention every tenth inspection period.

### QUANTITY OF OIL USED

Of course, the amount of oil added to each individual bearing at each inspection depends on the length of time or mileage between the oiling periods and also upon service conditions, the size of equipment and number of motors, the location of bearings, such as at the pinion or commutator end of armature or axle. Many railways maintain a definite height limit of oil in the various housing chambers and sufficient oil is added to bring this height to its maximum level. Under these conditions the amount added at a time will vary. Where definite amounts are specified for armature bearings oiled on a 1,000-mile basis, from ½ gill to 1 gill is the normal requirement. These quantities also apply to armature bearings oiled on a time basis where the interval is approximately one week, and on the two-week basis the quantities are doubled.



Lost Covers for Journal Boxes Do Not Protect Packing and Journals from Dirt

For axle bearings the quantities used are less than for armature bearings, but the average for the 1,000-mile basis is still between ½ and 1 gill, and on a weekly basis, ½ gill is found to be used most frequently.

Many railways have very complete lubricating schedules, in which the various types of equipment are divided into classes and the amount of lubricant, together with the inspection period, is given for each class. A few details taken from three answers show average practice and the variations that must necessarily result. These three railways were selected because they represent a small, an average and a large system, operating under different climatic conditions. Thus, one is in the extreme north, one in the central and the other in the southern section.

The Northern Ohio Traction & Light Company, Akron, Ohio, which operates approximately 402 passenger cars, nearly all of which have four motors each, stated that armature bearings for the Westinghouse 101-B2, 307 and 307-V and General Electric 204 motors are oiled every seven days. The armature bearings of Westinghouse 532-A are oiled every 15 days, using 8 gills of oil per car. The armature bearings of General Electric 240 and Westinghouse 333-V2 motors are oiled every 1,500 miles and 12 gills of oil are used per car. Axle bearings on old-type motors are oiled every seven days, while the later type motors are oiled every 15 days, using 4 gills of oil per car.

TABLE I—INSPECTION AND OILING PERIODS FOR ARMATURE AND AXLE BEARINGS

| Mileage Basis | | Time Basis | |
|---|---|---|---|
| Miles | Number Railways | Period in Days | Number Railways |
| 500 | 1 | 3 | 1 |
| 500 to 600 | 1 | 3 to 7 | 1 |
| 500 to 1,000 | 2 | 4 to 7 | 1 |
| 500 to 2,000 | 1 | 5 | 1 |
| 700 to 2,000 | 1 | 5 to 15 | 1 |
| 800 | 1 | 7 | 7 |
| 1,000 | 16 | 10 | 3 |
| 1,000 to 1,200 | 1 | 14 | 4 |
| 1,000 to 2,500 | 1 | 15 | 2 |
| 1,200 | 3 | 30 | 3 |
| 1,400 to 2,000 | 1 | | |
| | | Total | 24 |
| | | Car-Hour Basis | |
| 3,000 | 2 | 110 car-hours | 1 |
| Total | 31 | 200 car-hours | 1 |
| | | Total | 2 |

The journal bearings are oiled every 30 days and are entirely repacked once a year. Gears are lubricated every 30 days, when an average of 1 lb. of grease per gear is added. Compressors are given attention at every third inspection and the average quantity of compressor oil used per car per month is ½ gal. Side bearings, motorman's valves, controller fingers and controller cylinders are inspected and greased every three days. Brake cylinders are inspected every three days and are lubricated twice per year and door engines are inspected every three days and repacked once a year with hard grease. Center plates are lubricated once a month.

On the Montreal Tramways, which operates 1,246 passenger cars, armature and axle bearings are oiled weekly for regular cars and monthly for types of cars which perform less than 500 miles per month. Regular cars average ⅛ gal. per inspection and extras about 1/18 gal. per inspection. The routine inspection of journal bearings is carried out each spring and fall. An average of 1.4 gal. of oil per car per year is used. This includes new oil used when wheels are changed. Gears are given attention weekly, but the lubrication requires but one egg-cupful every fourth inspection. Compressors are inspected weekly and an average of 1/10 gal. per car is used. Motorman's valves are lubricated weekly with solidified oil. Controller fingers and cylinders and trolley wheels are inspected weekly, and controller fingers are again inspected the fourth night after.

Side bearings are inspected for clearance weekly, but they are lubricated only four times per year, using ¼ pint of oil per car. Old-style center plates are lubricated with heavy grease on each inspection. Brake cylinders are lubricated at the general overhaul periods, about once in 18 months.

The Memphis Street Railway Company, which operates about 275 passenger cars, lubricates armature and axle bearings of G. E. types 57 and 67 motors every 500 miles, using about ½ gill per bearing. G. E. 80 and 201 motors are lubricated on a 1,000-mile basis, using 1 gill per bearing. Truck journal bearings are repacked every 10,000 miles. Gears are given attention weekly, using about ¼ lb. of grease per gear, and compressors are given attention every 15 days, when an average of ½ pint of oil is added. Trolley wheels are given attention daily, a few drops of compressor oil being added for lubrication. Side bearings are oiled weekly with track oil. Brake cylinders are lubricated every 10,000 miles with brake cylinder compound. Motorman's valves receive weekly inspection, about ⅛ gill of oil being used. Controller fingers are lubricated with vaseline, and the cylinders are oiled weekly with about ⅛ gill of compressor oil. Trolley wheels receive a few drops of compressor oil daily.

### THREE PRINCIPAL CLASSES OF RAILWAY LUBRICANTS

The three principal types of lubricants used by electric railways are car oil, compressor oil and gear grease. Information in regard to the quantities of these three classes used by the 57 railways is shown in Table II. This table also shows the quantities used per car owned by the various railways and also contains information in regard to the number of pull-ins per month that occurred on these railways during the last six months of 1923 for hot bearings.

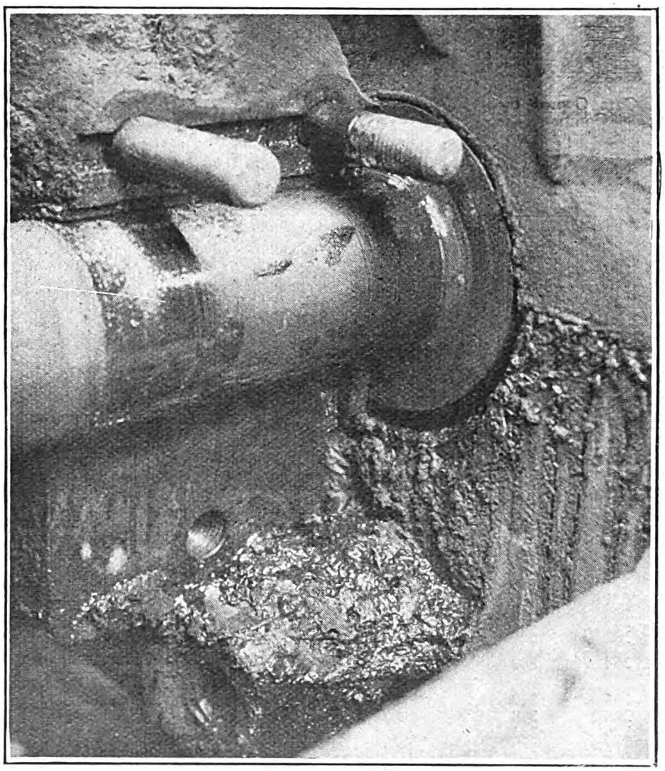
An analysis of this table shows a wide variation in the quantities of lubricants used, and in some cases it is evident that the figures do not indicate the exact condition. Where blank spaces occur in the table information was not available, so that definite conclusions could not be reached.

The number of gallons of car oil per car per year varies from a minimum of 3.4 gal. to a maximum of 62.3 gal. A total of 502,776 gal. of car oil was used for 29,674 cars. This is an average of 16.9 gal. of car oil per car per year. Even though the variation is very great, it appears that the average results should indicate very closely the quantities required under average conditions. Ordinarily it is not possible to compare the lubrication of two independent properties on a car basis, as the amount of lubricants used for bearings and gears is in reality a function of the number of motors used, the severity of service and type of oil used. Some roads use two-motor equipments entirely, while others may have a majority of four-motor equipments. Also the age of the equipment has much to do with the amount of lubricant needed. Some of the older type motors are still arranged for grease lubrication, and due to worn parts more lubricant is required than would be necessary for modern up-to-date motors. The mechanical condition of the equipment undoubtedly has a very important bearing on the amount of lubricant used, and certainly service conditions affect it. And a road with few cars operating a large mileage per day will certainly require more oil than one with a greater number of cars operating less miles per day.

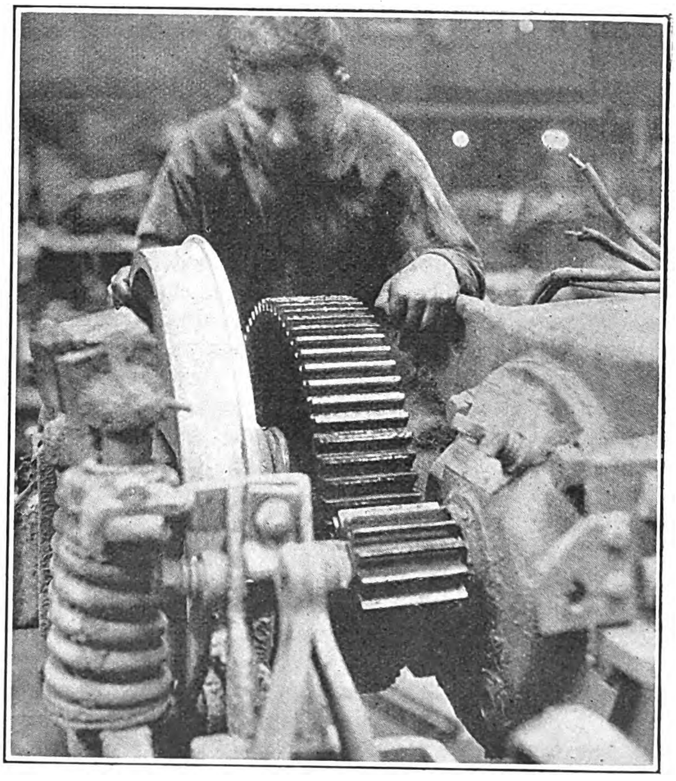
Considering the amount of compressor oil used the table shows a total of 72,357 gal. for 28,286 cars. This is an average of 2½ gal. of compressor oil per car per year. Here again the car basis of comparison is not strictly accurate, since the amount of compressor oil used will vary with the number of compressors in active service.

The amount of gear grease used also shows a wide variation and it is evident that many of the roads have given total amounts of gear grease purchased, including that used for other purposes than the lubrication of gears. The tabulation shows a total of 519,193 lb. as used for 28,685 cars. This is an average of 18.1 lb. of gear grease per car per year.

The average figures should give a very accurate idea of the total amount of these three classes of lubricants used by the electric railway industry. The statistics published in the Jan. 5, 1924, issue of ELECTRIC RAILWAY JOURNAL show a total of 105,000 cars used by electric railways in the United States. Taking the average amount of the three classes of lubricants as shown in Table II, there is indicated a total annual consumption of 1,774,500 gal. of car oil, 262,500 gal. of compressor oil and 1,900,500 lb. of gear grease by the electric railways for lubrication of rolling stock.



**The Rapidly Rotating Gears Are Sure to Throw Grease to Any Crack or Opening in the Gear Case Where it Oozes Out and Falls to the Street**



**A Satisfactory Gear Lubricant Must Stick to the Teeth of the Gears and Pinions**

TABLE II—QUANTITIES OF CAR LUBRICANTS USED, AND PULL-IN RECORDS FOR HOT BEARINGS AS SHOWN BY DATA FROM 57 ELECTRIC RAILWAYS

| Cars Owned by Company |  | Gal. Car Oil Used per Year |  | Gallons Compressor Oil Used per Year |  | Pounds Gear Grease Used per Year |  | Pull-In Record for Hot Bearings Last Six Months of 1923 |  |
|---|---|---|---|---|---|---|---|---|---|
| Total | Passenger | Total | Per Car | Total | Per Car | Total | Per Car | Average Cars Pulled in per Month | Per Cent of Passenger Cars Pulled in per Month |
| 18 | 16 | 440 | 24.4 | 165 | 9.2 | ....... | .... | 0.0 | 0 |
| 29 | 24 | 275 | 9.2 | ...... | ... | 2,000 | 68.9 | 0.5 | 2.1 |
| 36 | 30 | 115 | 3.8 | 20 | 0.6 | ....... | .... | 0.1 | 0.3 |
| 36 | 24 | ....... | .... | ...... | ... | ....... | .... | 3.0 | 10.0 |
| 60 | 45 | 1,650 | 26.7 | ...... | ... | ....... | .... | 0.0 | 0 |
| 79 | 39 | 300 | 3.8 | 100 | 1.3 | 950 | 12.0 | 3.0 | 7.7 |
| 93 | 87 | ....... | .... | ...... | ... | ....... | .... | 0.0 | 0 |
| 103 | 85 | 1,200 | 11.6 | 360 | 3.5 | 1,900 | 18.4 | 0.3 | 0.4 |
| 118 | 60 | 1,100 | 9.3 | 275 | 2.3 | 1,600 | 13.6 | ...... | ... |
| 122 | 91 | 1,800 | 14.8 | 120 | 0.9 | 1,800 | 14.8 | 0.5 | 0.5 |
| 130 | 84 | 1,540 | 11.9 | 660 | 5.1 | 6,600 | 50.8 | 4.1 | 4.9 |
| 138 | 53 | ....... | .... | ...... | ... | ....... | .... | 0.2 | 0.4 |
| 151 | 126 | 4,350 | 28.7 | 1,100 | 7.3 | 5,000 | 33.1 | 2.7 | 2.1 |
| 166 | 114 | 2,385 | 14.3 | 495 | 3.0 | 6,342 | 38.2 | 0.7 | 0.6 |
| 172 | 152 | 4,200 | 24.4 | ...... | ... | 7,000 | 40.7 | 4.3 | 2.2 |
| 177 | 146 | 4,400 | 24.8 | ...... | ... | 7,200 | 40.7 | 3.0 | 2.0 |
| 180 | 144 | 2,566 | 14.2 | 450 | 2.5 | ....... | .... | 6.0 | 4.2 |
| 180 | 151 | 6,500 | 36.1 | 675 | 3.7 | 6,000 | 33.3 | 0.0 | 0 |
| 183 | 164 | 2,200 | 12.0 | 660 | 3.6 | ....... | .... | 2.0 | 1.2 |
| 205 | 191 | 7,088 | 34.5 | 1,568 | 7.6 | 5,788 | 28.2 | 0.0 | 0 |
| 209 | 149 | 4,675 | 31.4 | 660 | 3.1 | ....... | .... | 3.6 | 2.4 |
| 210 | 80 | 5,000 | 23.8 | ...... | ... | ....... | .... | 0.2 | 0.3 |
| 212 | 187 | 2,000 | 9.5 | ...... | ... | 2,500 | 11.8 | 3.6 | 1.9 |
| 214 | 209 | 4,180 | 19.5 | ...... | ... | 8,800 | 41.1 | 0.7 | 0.3 |
| 221 | 100 | 2,590 | 11.7 | 276 | 1.3 | 3,292 | 14.9 | 4.3 | 4.3 |
| 221 | 175 | 4,012 | 18.1 | ...... | ... | 7,880 | 35.2 | 1.4 | 0.8 |
| 223 | 200 | 2,700 | 12.2 | 1,100 | 5.0 | 7,300 | 32.8 | 2.0 | 1.0 |
| 234 | 220 | 800 | 3.4 | 113 | 0.5 | 1,500 | 6.4 | 0.0 | 0 |
| 253 | 175 | 4,510 | 17.8 | 369 | 1.5 | 1,917 | 7.6 | 7.0 | 4.0 |
| 254 | 242 | 2,200 | 8.7 | 770 | 3.0 | 10,700 | 42.1 | 10.5 | 4.4 |
| 266 | 249 | 4,959 | 18.7 | 2,969 | 11.1 | 2,528 | 9.5 | 1.0 | 0.4 |
| 288 | 230 | 3,946 | 13.7 | 311 | 1.1 | 7,133 | 24.8 | 8.0 | 3.4 |
| 326 | 231 | ....... | .... | ...... | ... | ....... | .... | 4.4 | 1.9 |
| 327 | 140 | 10,308 | 31.5 | 750 | 2.3 | 6,071 | 18.5 | 1.0 | 0.7 |
| 350 | 274 | 7,194 | 11.9 | 595 | 1.7 | 9,384 | 26.8 | 1.5 | 0.5 |
| 358 | 214 | 8,000 | 22.3 | 1,800 | 5.0 | 1,200 | 3.4 | 3.3 | 1.5 |
| 360 | 325 | 9,500 | 26.4 | 252 | 0.7 | 22,500 | 62.5 | 0.0 | 0 |
| 384 | 178 | 2,716 | 7.1 | 395 | 1.0 | 3,350 | 9.6 | 4.8 | 2.7 |
| 409 | 229 | ....... | .... | ...... | ... | ....... | .... | 1.0 | 0.4 |
| 436 | 223 | 10,772 | 48.3 | 1,659 | 3.8 | 9,192 | 21.1 | 8.1 | 3.6 |
| 464 | 407 | 8,500 | 18.3 | 1,400 | 3.0 | 18,959 | 40.8 | 8.6 | 2.1 |
| 510 | 400 | 7,994 | 15.7 | 3,540 | 6.9 | 16,847 | 33.0 | 7.0 | 1.7 |
| 547 | 414 | 12,340 | 22.5 | 1,460 | 2.7 | 660 | 15.8 | 7.0 | 1.6 |
| 847 | 785 | 7,486 | 8.8 | 515 | 0.6 | 12,480 | 14.7 | 12.0 | 1.5 |
| 879 | 755 | 18,000 | 20.5 | 3,500 | 4.0 | 20,000 | 22.7 | 5.8 | 0.8 |
| 930 | 738 | 15,000 | 16.1 | 2,280 | 2.4 | 5,900 | 6.3 | 9.0 | 1.4 |
| 960 | 664 | ....... | .... | ...... | ... | ....... | .... | ...... | ... |
| 1,077 | 872 | 27,000 | 25.0 | 3,800 | 3.5 | 4,800 | 4.5 | 38.0 | 4.4 |
| 1,145 | 837 | 16,680 | 14.6 | 1,680 | 1.4 | 56,700 | 49.5 | 10.0 | 1.2 |
| 1,150 | 415 | 71,700 | 62.3 | 575 | 0.5 | 5,130 | 4.5 | 10.5 | 2.6 |
| 1,469 | 1,246 | 11,000 | 7.5 | 1,100 | 0.7 | 26,000 | 17.7 | 14.0 | 1.1 |
| 1,789 | 763 | 64,465 | 36.0 | 4,690 | 2.6 | 73,437 | 41.0 | 12.3 | 1.6 |
| 1,825 | 1,435 | 25,000 | 13.7 | 9,000 | 4.9 | 28,000 | 15.3 | 14.7 | 1.0 |
| 1,843 | 1,466 | 21,227 | 11.5 | 4,178 | 2.2 | 26,803 | 14.6 | 5.0 | 0.3 |
| 1,850 | 1,709 | 8,400 | 4.6 | 2,573 | 1.4 | 16,190 | 8.7 | 2.0 | 0.1 |
| 2,535 | 1,918 | 40,000 | 15.8 | 9,000 | 3.5 | 25,600 | 10.1 | 6.7 | 0.4 |
| 3,592 | 3,106 | 18,813 | 5.2 | 5,399 | 1.5 | 16,261 | 4.5 | 17.5 | 0.5 |
| 31,543 | 23,786 | 502,776 gal. for 29,674 cars | 16.9 | 72,357 gal. for 28,286 cars | 2.5 | 519,193 lb. for 28,685 cars | 18.1 | 277.2 pull-ins per month for 23,062 cars | 1.2 |

An effort has also been made in this survey to obtain information as to the number of cars pulled in during a period of six months for hot bearings. This information is also shown in Table II. The number of passenger cars removed from service per month for hot bearings varied from zero to 10 per cent of the total. Eliminating two small roads, the percentage of passenger cars per month removed from service for hot bearings varies up to a maximum of 4.9 per cent. A total of 277.2 pull-ins, average per month, for hot bearings is shown for 23,062 cars, or 1.2 per cent of the total passenger cars operated.

This information has also been analyzed by comparing the number of hot bearings with the quantities of oil used. There were seven companies owning a total of 1,150 cars, of which 1,035 were passenger cars that reported no pull-ins during a period of six months for hot bearings. The amount of car oil used per year on these seven properties was 25,978 gal., or an average of 24.6 gal. per car. There were also six roads which gave the percentage of passenger cars per month removed from service for hot bearings as from 4.0 to 4.9 per cent. These six companies operated 2,115 passenger cars, and used a total of 40,406 gal. of car oil, or an average of 19.1 gal. per car per year. The railways with the best records show an average consumption of 5.5 gal. per year more than the six companies with high records of hot bearings. This would seem to indicate that the quantity of car oil used is at least one factor affecting the number of hot bearings.

### BOTH MILEAGE AND GALLONAGE BASIS USED FOR PURCHASING LUBRICANTS

Car lubricants are purchased either on a mileage or a gallonage basis and the two methods are about equally followed. Of the 57 railways, 26 use the mileage basis and 31 the gallonage basis. By far the greatest number of railways purchase their lubricant on contract. Forty-seven companies purchase this way as against six which purchase in the open market, and four which purchase part of their lubricants on contract and part in the open market.

# Overcoming Current-Collection Troubles on Steel Wire

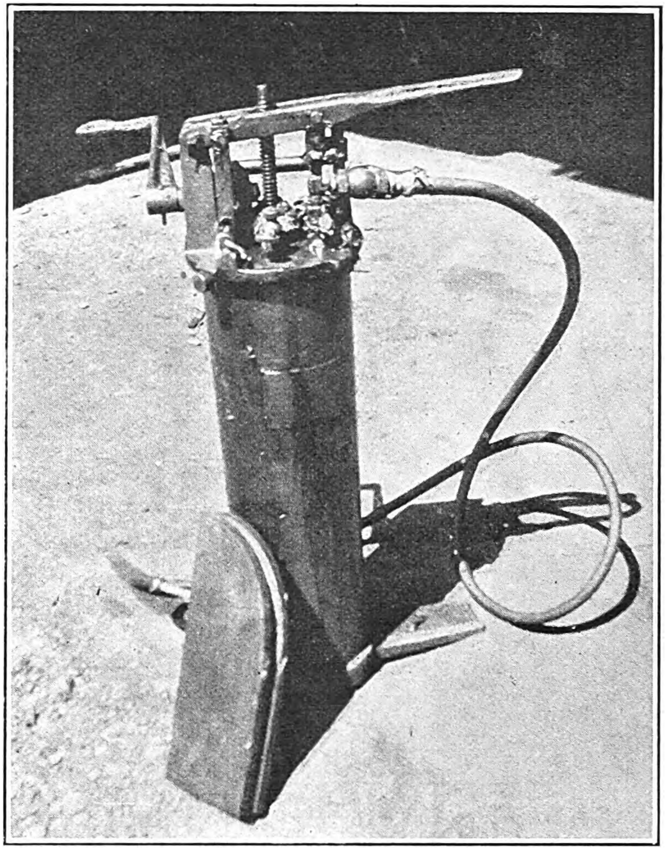
### Investigations Made at Fort Worth, Where Much of the Overhead Construction Is of This Material, Demonstrated the Superiority of Trolley Shoes Under Those Conditions —Methods of Lubricating the Trolley Wire Are Described

*By H. M. Robinson*
Mechanical Engineer Northern Texas Traction Company, Fort Worth, Tex.

THE necessity of replacing trolley wheels after they had run only 500 or 1,000 miles caused the Northern Texas Traction Company, Fort Worth, to make a careful study some time ago to determine the cause of such excessive wear. At that time the trolley wheels were arcing badly because of the irregular shape which they acquired soon after being installed.

As the first step, special efforts were made to insure all trolley wheels being properly assembled, but this did not help matters. As the next step, the tension on the trolley bases was gradually increased until it became as high as 50 lb. on some cars. This also failed to check arcing to any considerable extent. As a result of the increased tension, however, trolley wire breaks increased until they reached an average of 45 per month.

A careful examination of trolley wheels on all cars showed that about 75 per cent had high and low places, or flat spots over the entire surface of the wheel throat. It was assumed that the wheels were faulty in some respects, and in order to determine exactly the nature of the trouble 12 cars on various lines were equipped with new trolley wheels, and the condition of these wheels noted at frequent intervals. The first day or two that the new wheels were in service there was no trouble with any of them. After that, however, it was observed that the wheels were arcing on cars operated on two lines, and the longer the cars ran the worse the arcing. Upon examination the trolley wheels were found to have many flat spots.



Grease Gun and Spreader Used by the Northern Texas Traction Company for Lubricating Trolley Wire

SLIDE PERFORMANCE BY LINES

| Line | Type Cars Operated | Number of Cars | Per Cent Kinds Trolley Wire | | | Number Slides | Average Mileage | Cost per 1,000 Car-Miles, Cents |
|---|---|---|---|---|---|---|---|---|
| | | | Copper Alloy | Steel | Copper | | | |
| St. Louis Ave..... | Birney | 3 | 43 | .. | 57 | 15 | 8,832 | 0.20 |
| So. Main......... | Birney | 8 | 31 | .. | 69 | 41 | 7,694 | 0.23 |
| University....... | Birney | 4 | 58 | .. | 42 | 20 | 10,679 | 0.166 |
| Henderson....... | Birney | 4 | 48 | .. | 52 | 16 | 11,798 | 0.155 |
| Hend. Uni. and Hemphill...... | Birney | 7 | 43 | .. | 57 | 36 | 8,523 | 0.207 |
| Summit Ave...... | Birney | 5 | 39 | 8 | 53 | 29 | 8,903 | 0.199 |
| Forest Park...... | Birney | 3 | 34 | 11 | 55 | 21 | 7,935 | 0.223 |
| Arlington Hts.... | Birney | 4 | 19 | 44 | 37 | 88 | 3,529 | 0.537 |
| Polytechnic...... | Birney | 8 | 79 | .. | 21 | 53 | 9,035 | 0.196 |
| Third Ward...... | Birney | 2 | 36 | 1 | 63 | 10 | 7,093 | 0.253 |
| Samuels......... | Conv. Sfty. | 4 | 51 | 9 | 40 | 10 | 9,959 | 0.178 |
| First Street...... | Conv. Sfty. | 1 | .. | .. | 100 | 2 | 6,688 | 0.265 |
| Exchange Ave.... | Conv. Sfty. | 1 | 5 | 4 | 91 | 4 | 7,645 | 0.232 |
| Central Ave...... | Conv. Sfty. | 1 | 20 | 5 | 75 | 6 | 5,287 | 0.335 |
| Fostepco Hts..... | Conv. Sfty. | 1 | .. | .. | 100 | 4 | 5,958 | 0.297 |
| Stock Yards and Lakeview..... | Dbl.-Trk. | 10 | 66 | 2 | 32 | 61 | 7,935 | 0.223 |
| Rosen Hts....... | .......... | .. | .. | .. | ... | .. | ..... | ..... |
| Evans Ave....... | Dbl.-Trk. | 11 | 52 | 2 | 46 | 75 | 8,535 | 0.204 |
| Extra........... | Birney | 17 | .. | .. | ... | 61 | 7,558 | 0.234 |
| Extra........... | Conv. Sfty. | 2 | .. | .. | ... | 5 | 5,978 | 0.297 |
| Extra........... | Dbl. Trk. | 1 | .. | .. | ... | 2 | 5,989 | 0.296 |

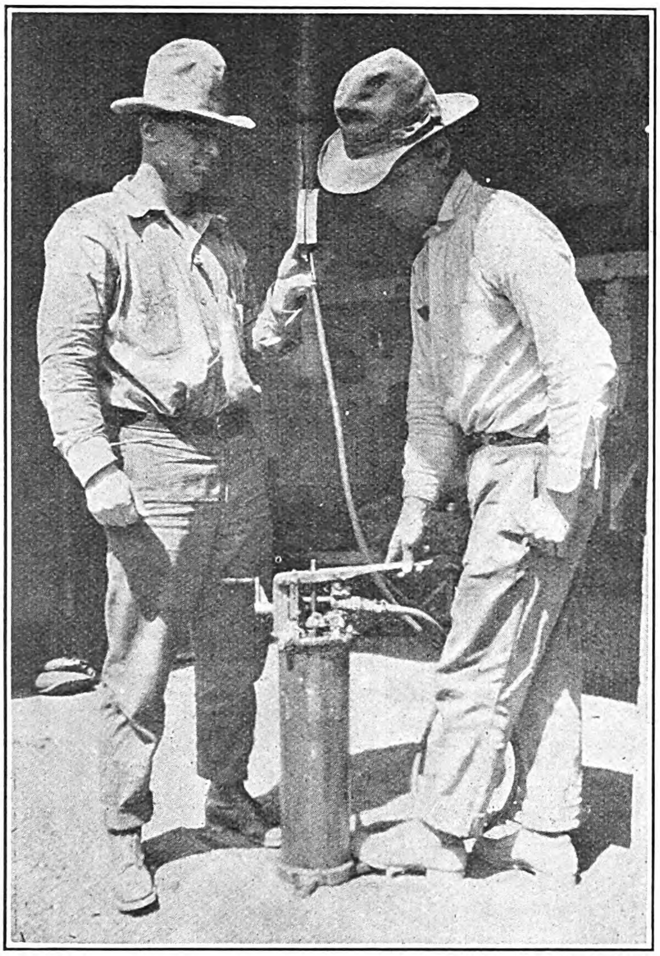
| | |
|---|---|
| Total number of slides used during test.............................. | 59 |
| Average car-miles per slide.............................. | 7,618 |
| Average cost per 1,000 car-miles, cents.............................. | 0.232 |

*Note:*—The heading above "No. Cars" indicates the largest number of cars equipped with slides operated regularly on that particular line.

On the other lines, however, the new wheels did not show the same tendency to become rough. With the assumption still in mind that trolley wheels were faulty, the railway purchased 50 more of another type and tested them in the same way as the first wheels had been tested. The results of the second test showed up exactly the same as the earlier one.

It was thought, however, that the fact that the overhead wire was of steel on the lines where the arcing was worst might be significant. During the war when copper was scarce the Northern Texas Traction Company installed on its city lines in Fort Worth about 1 mile each of steel and copper alloy trolley wire. New installations had been made from time to time until several miles of such wire was in service on different routes at the time these experiments were made.

A new theory of the trouble was then tried and it was assumed that the wheels were all right while the trolley wire was faulty. Several cars on each line were equipped with new trolley wheels and they were thereafter confined for the period of the test to the lines on which they were first placed. The trolley wheels on cars which ran on lines with hard-drawn copper trolley wire remained in almost perfect condition, did not arc and covered on the average 8,000 miles before replacement was necessary.



Showing How the Spreader Is Held and the Method of Operating the Gun

In contrast to this, the wheels performed poorly on lines where the major portion of the wire was of steel or copper alloy. After the first day or two these wheels "showed high and low spots" around the surface of the wheel throat. The trolley wheels on cars running principally under the steel wire made mileages varying from only 480 to 950 before it was necessary to replace them because of excessive vibration and arcing.

In order to make absolutely certain that the wheels were not faulty, the company took four cars equipped with test wheels which had been running exclusively under hard-drawn copper wire and ran them on a line where the greater part of the trolley wire was steel. These trolley wheels were in good condition before the change and had made in excess of 7,000 miles under copper wire. But after running for about four hours under the steel and copper alloy overhead, the wheels on these cars became rough and arced. This convinced the railway that either the steel wire or the copper alloy wire, or both, caused the flat spots to develop on the wheels, and that the wheels themselves were not at fault.

Similar conditions were noted in tests conducted on other lines where the cars operated under a good deal of steel and copper alloy wire. The conclusion was reached that the steel and copper alloy trolley wire is slippery and hard, and that the street car in starting "gets out from under" the trolley wheel. In other words, the coefficient of friction between the trolley wheel and either the steel or the copper alloy wire is not sufficient to make the wheel roll rapidly enough to keep from sliding. The hard-drawn copper wire, being softer and having a rougher surface than the steel or the copper alloy wire, offers more friction between the wheel and the wire, thus causing the trolley wheel to rotate rather than slide.

Due to the fact that many of the lines in Fort Worth have both steel and copper alloy wire, as shown in the accompanying table, it was impossible to conduct any tests to find out which of these two was causing the more trouble.

As before mentioned, the trolley wire breaks had increased to an average of 45 per month, largely on account of the fact that the flat spots on the wheels were damaging the wire and causing it to crystallize just inside the ears. This was a serious state of affairs and it was felt that prompt remedial measures were necessary. As a possible solution, it was decided to substitute Miller trolley shoes on the city and interurban cars in place of the trolley wheels. After this change the company kept an accurate record of mileage and performance. It was found that the shoes gave excellent contact with few dewirements, although only 15 lb. tension was used in the trolley base instead of 25 to 35 lb. tension required when using trolley wheels.

It was observed that these shoes made the hard-drawn copper wire very rough and scaled it considerably.

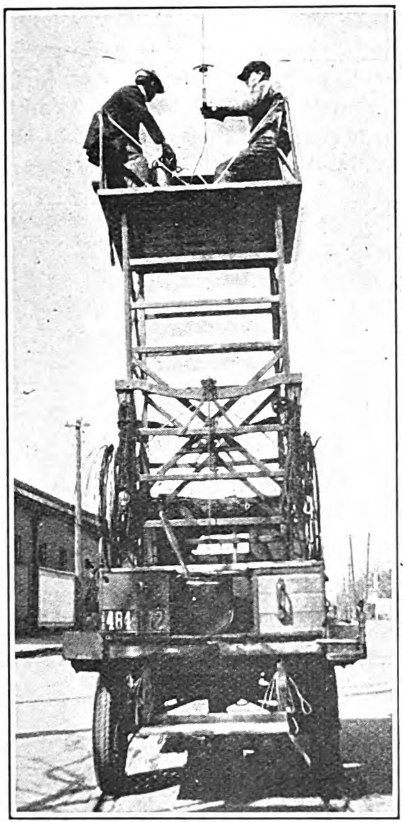
COMPARISON OF REPLACEMENT COSTS FOR COLLECTION EQUIPMENT FOR THE YEARS 1920 AND 1922

| *Year* 1920 | Used | Cost |
|---|---|---|
| Trolley poles 10 ft. 8 in. | 128 | $363.52 |
| Trolley poles 12 ft. 6 in. | 95 | 351.50 |
| Fixtures: | | |
| Bearings | 738 | 287.82 |
| Renewable washers | 1,561 | 93.66 |
| Contact rings | 1,476 | 291.88 |
| Contact springs | 1,669 | 216.97 |
| Trolley harps, type "C" | 200 | 480.00 |
| Trolley rope | 1,850 | 1,377.60 |
| Trolley wheels | 1,932 | 3,272.32 |
| Total replacement costs for year 1920 | | $6,735.27 |
| *Year* 1922 | | |
| Trolley poles 10 ft. 6 in. | 44 | $161.04 |
| Trolley poles 12 ft. 6 in. | 63 | 285.39 |
| Fixtures: | | |
| Bearings | 60 | 23.40 |
| Renewable washers | 128 | 3.34 |
| Contact rings | 96 | 13.24 |
| Contact springs | 110 | 14.30 |
| Trolley harps type "C" | 0 | .......... |
| Trolley rope | 1,399 | 798.16 |
| Trolley wheels, 6 in. | 621 | 838.35 |
| Miller trolley shoes | 159 | 802.95 |
| Miller contacts | 1,343 | 2,377.11 |
| Miller shunts | 86 | 57.68 |
| Miller lockwashers | 6 | .29 |
| Miller bolts and nuts | 469 | 15.01 |
| Miller center pins | 32 | 18.24 |
| Total replacement costs for year 1922 | | $5,408.50 |
| Difference in total costs for the two years in favor of the year 1922 | | $1,326.77 |
| Cost per M.C.M. for collection equipment, 1920, cent | | 0.751 |
| Cost per M.C.M. for collection equipment, 1922, cent | | 0.642 |

*Note:*—All cars were equipped with 6-in. trolley wheels during 1920, while during 1922 a large per cent of the cars were equipped with Miller trolley shoes.

*Note:*—In the above comparative costs the cost of trolley bases and repairs are not considered.

After careful study of this situation it was decided to grease the trolley wire. As a result of experiments the use of a mixture of No. 2 cup grease and graphite was selected as the trolley wire lubricant. By the use of apparatus, mounted on the line car on the interurban, and the line truck in the city, the company now greases the entire overhead about once every three months. An "Alemite" H-15 compressor gun is used. This has a capacity of 15 lb. of grease, or enough to lubricate 12 miles of trolley wire. The grease is forced up through a tube from the gun to the spreader, which is a wooden block 9 in. x 5 in. grooved to fit the wire. A hole through the block connects the tube and the groove. Three men compose the greasing gang, one to operate the vehicle, one to work the grease gun and one to hold the spreader on the wire.


Greasing Trolley Wire from the Tower of the Line Truck at Fort Worth

Greasing the trolley wire, amounting to about 77 miles of city track and 100 miles of interurban track, puts an additional cost of about $100 every three months on the line department. The trolley wire greasing is not very popular with the linemen for the reason that it is a rather dirty job. However, no serious trouble with the linemen has been experienced on this account. The increased cost to the line department on account of the use of Miller shoes has been more than offset by the saving to the mechanical department.

The greasing of the trolley wire has caused it to wear very smoothly and take a high polish. Since the railway commenced this practice the wear on the wire has been measured by a micrometer and it has been found to be much less than when the trolley wheels were used. Due to the fact that the Miller trolley shoe does not cause any vibration of the trolley wire, the breaks have decreased to an average of two per month. From present appearances the number of breaks will decrease even more than that in the future. The Miller trolley shoes in city service average more than 7,500 miles per shoe, and in interurban service they average better than 3,000 miles per shoe.

Although the difficulty of backing up with the Miller trolley shoe without tearing down the overhead is a disadvantage, the advantages in favor of it are sufficient to cause the railway to adopt it for its entire system, in both the city and interurban service. The advantages may be summarized as follows: A smooth running contact which causes hardly any noise in the car as compared to a trolley wheel contact; a great deal more contacting surface with the trolley wire than that offered by a wheel; lower trolley tension; very few dewirements as compared to a wheel contact; a decrease in the number of trolley breaks; a small saving to the company over the use of trolley wheels and a large gain to the company in public good will because of fewer trolley breaks, less noise within the car and no trolley arcing.

# Traveling Workshop for Welding Crew Saves Time

### Special Car for Use with Thermit Process Facilitates Transporting Materials and Equipment to the Job—Time Is Saved in Making Molds and Work Is Possible Regardless of Weather

WHEN doing welding with the thermit process it is necessary to transport a considerable amount of material as well as tools and special equipment. The employees of the welding department of the Milwaukee Electric Railway & Light Company have equipped a double-truck car for the purpose of carrying this to the job and providing a workshop that has facilitated the work and made it possible to operate under conditions which would otherwise have prevented work.

The former practice of the thermit welding crew was to sack the sand and fire clay and transport it by truck to the job along with the preheaters, thermit portions, mold boxes, crucibles and all other necessary equipment. There it was unloaded alongside the curb. A box was used for a molding bench and the molds were rammed by hand.

If the job was of more than one day's duration, the material and equipment were stacked together, covered with a canvas and left at the close of a day's work. If the work was of a nature requiring several days' welding a small tool house on wheels was made use of, but most of the time the canvas cover was the only protection from the elements.

It was always difficult to arrange for trucks at the right time to move the crews and supplies. Much time had to be spent by the men in loading, unloading and transporting their equipment. There was no shelter on most of the jobs where they could even find a place to eat their lunch in cold and rainy weather.

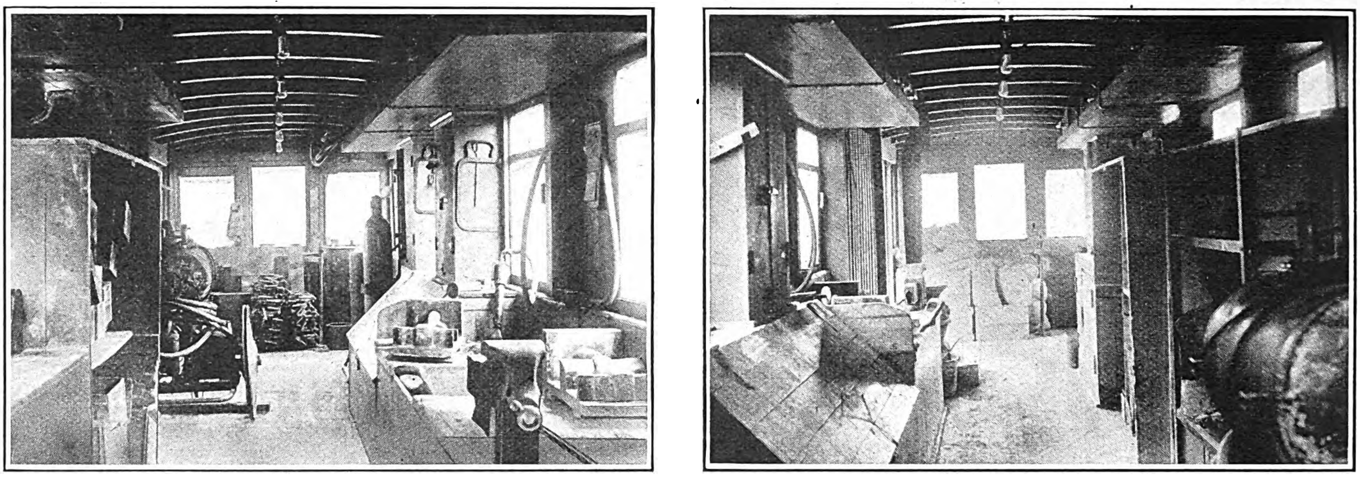
Delays always were considerable while waiting for the trucks and for material. Delays also were caused by weather conditions or by loss or wrecking of equipment by persons outside of the organization. The wind would blow away some of the fire clay, and when placed on rough and dirty streets some of it was lost because it could not be used to the bottom of the pile. Rain would make the sand too wet, and in cold weather the molds were frozen and had to be thawed out before they could be used.

### WELDERS' CAR HAS COMPLETE EQUIPMENT

In order to increase the efficiency of the work, a car was turned over to the welders and equipped under the direction of their foreman, Hilbert Stieglitz, as a combined storage and workroom.

On one side of the car is a work bench, equipped with a vise. This was installed in such a manner that it could be removed and a stove erected in its place to keep the car warm for winter work. Alongside it is a molding bench with an opening in the center to store the mixture of sand and fire clay. The car is equipped with air, and a pneumatic sand rammer is used for making molds. Any excess material falls back into the bin, so that there is practically no loss. Next to the molding bench is a large tool box for sledges, lining bars, shovels, etc., with two cupboards above for the small tools. The balance of the car is left for the storage of preheaters.

On the other side are lockers for the men, a cupboard for oil cans beneath a desk for the foreman, a frame for mold boxes and an asbestos lined rack providing space for eight crucibles, which suffices for a day and a night crew, leaving a space for preheaters between this rack and the door.



The Interior Views of the Milwaukee Welders' Car Show the Arrangement of the Benches and Storage Compartments

In the front at one end are a rack with compartments for inserts and two vertical square posts to carry the mold clamps. At the other end of the car the space is utilized for the storage of boxes of welding portions and bags of fire clay and sand. In addition there is space for fifteen bags beneath the molding bench.

Under the roof on either side are suspended shelves for about twelve sets of patterns. Equipment such as mold boxes, clamps, patterns, inserts and tools are all placed in racks or in cupboards so that they are not subjected to the misuse to which they were put by former methods.

Besides one two-burner and two single-burner preheaters, a small truck with acetylene and oxygen tanks, together with the necessary gages, regulator and cutting torch, constitutes a part of the regular equipment.

The car is more satisfactory to the men, for they have a locker for their clothes, they have a place to get dry in rainy weather and warm in cold weather. Previously it was almost impossible for the night crew to find a place in which to eat their lunch.

In the wintertime, when the car is equipped with a stove, the molding sand is kept dry and warm. Molds can be made in the car and taken directly to the rail joint to be welded, thus making it possible to weld the year around, except in extremely cold weather. Formerly these molds were made in the material yard, and an endeavor was made to get them by truck to the welding job before they were frozen, but invariably they had to be thawed out before using, which made the thermit welding rather risky.

### REAL SAVINGS MADE WITH THE CAR

Numerous savings are made by the use of this car. Less molding sand and fire clay are used, and there is no loss of molds in freezing and rainy weather. The time in loading and transporting material is less, and no time is wasted in piling material up on the street, where some of it was bound to be lost or stolen. There is a saving of coke burned in salamanders, used for thawing out molding materials. More joints can be made by the same number of men, because the materials for day and night shift are loaded into the car by the night crew between 9 o'clock, when they report for duty, and midnight, when the track is turned over to them for welding.

The wear and tear on the preheaters in loading them on trucks and unloading them was one thing which gave much concern. All three of the preheaters are carried in the car and unloaded from the car on plank runways designed for that purpose.

Members of the welding crew are broken in as motormen so that there is no additional expense for the operation of the car.

This car permitted an increase in the number of joints made with the regular crews to such an extent that it is stated there is no other street railway in the United States obtaining equal output. Much of the success obtained is due to the welding car.

From a safety standpoint, this car has been valuable, as tools and equipment are in better condition, hot crucibles are placed in a fireproof rack and there is no danger of burning up canvas covers or costly materials. Both materials and equipment are kept dry, which eliminates the great hazard of running the hot molten metal against damp molds or crucibles.

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## Keep Brush Pressure Uniform

CARBON brushes in the same brush holder should have equal pressure, otherwise the one with greater pressure will take more than its share of current and will heat to a point that may cause damage to the brush, the brush holder or commutator. Excessive pressure will also shorten the life of both brush and commutator.

# Changing Gage on Railroad Grade Crossings

### Work of Cutting Down Standard Gage Manganese Steel Intersections to Narrow Gage was Done in the Field with Oxygen-Hydrogen Torch, Interrupting Traffic Only Briefly

BY W. L. WHITLOCK
The Denver Tramway Company

IN THE summer of 1922 it became necessary to change a double-track line from standard gage to a gage of 3 ft. 6 in. to conform to the track gage as the rest of our system. This line was approximately 3 miles in length, double-tracked, and this brought up numerous problems, including car service during the period and other details incident to the field work, but the biggest nut to crack was the matter of eight railroad crossings, four of solid cast manganese construction and four of bolted construction, all conforming to the standard 100-lb. A.S.C.E. rail section.

These crossings were all in excellent condition, having been in service since January, 1914. All were in paved streets. The way department was convinced that these could be changed in the field and the expense of new railroad crossings saved, but the engineers of the railroads had many doubts, as to do the job by means of the cutting torch and air drills was a radical departure from their standard practices. The work on the manganese crossings looked unusually difficult in view of the known peculiarities of manganese steel. However, a number of experiments were carried on in the material yard and at the factory of the Colorado Compressed Gas Company, through the courtesy of P. D. Gleason, the manager, using scrap manganese special trackwork, and these experiments convinced us that it could be done.

## THE OXY-HYDROGEN PROCESS WAS ADOPTED FOR CUTTING RAILS

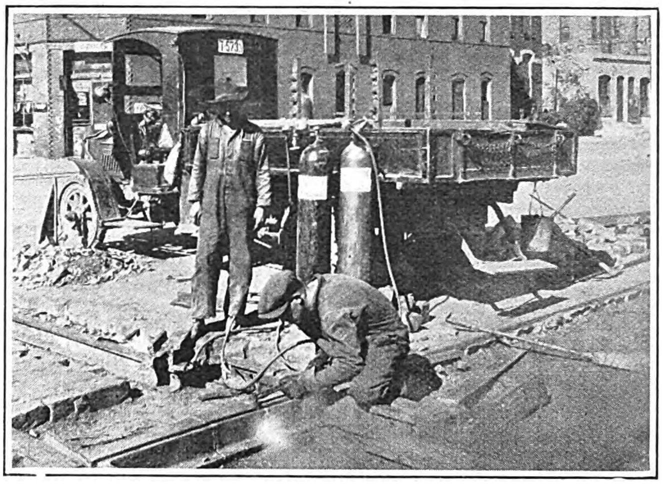
Both oxygen-acetylene and oxygen-hydrogen cutting torches and equipment were used in the experiments and the oxygen-hydrogen process was adopted, as the experiments showed less carbonization of the metal and a quicker and longer cutting flame with this equipment. Also, it has a lower flame temperature.

The first manganese crossing to be worked over was a 90-deg. square railroad crossing of standard gage track over standard gage track, constructed by the Ajax Forge Company, and was of the "U" section conforming to 100-lb. A.S.C.E. rail section at the ends. The narrow gaging of the street car portion of the crossing necessitated the removal of 14½ in. of each rail of the railroad track portion, pulling the crossing to the new gage and making a new joint. This was accomplished in the following manner:

The street paving of stone blocks was removed entirely from the crossing. All spikes were pulled and the connecting joints at all ends were removed. This crossing was cast in two sections on being manufactured. Measurements were made from gage lines and the rails lightly marked with a chisel for cutting points. As the street car traffic had been rerouted and was on the opposite track and the railroad traffic stopped for four hours, the crossing was cut loose and raised slightly by means of steel wedges in order to permit the flow of molten metal on the underside of the base of the crossing during the cutting period.

The cuts were made successfully in a very few minutes and the new bolt holes were also made with the cutting torch. A piece of ¾-in. x 4½-in. x 22-in. guard rail steel was used for a splice on the inside of the crossing and a standard 100-lb. angle bar used on the outside of the crossing. These were held in place by 1-in. machine bolts. Due to the width of the "U" section, it was necessary to use machine bolts. The steel wedges were withdrawn and the crossing let down on the ties and respiked and paved in and new pieces of rail cut in between the two street railway tracks and on the adjoining railroad track to make up for the difference between the old standard gage crossing and the new narrow gage crossing.

After eighteen months of service these crossings are apparently in as good condition as before. There are no indications of any kind that show that this cutting has in any manner affected the manganese material in these crossings.



Cutting Manganese Steel Intersection in the Field to Change Track Gage

The accompanying picture shows the field operation with the first piece of removed crossing at the right foot of the man standing. In the foreground is shown the first half of the crossing in place to the new gage. The two cuts, one being made at the time the picture was taken, show the amount of rail removed, while the piece already removed shows a good cross section of the manganese crossing construction. The tangent rail at the left of the picture has already been pulled over to the 3-ft. 6-in. track gage. The Packard truck is one of the way department trucks used on minor track maintenance work and emergency trackwork.

## HOW GAGE WAS CHANGED ON ORDINARY TRACKWORK

The plain bolted 100-lb. O.H. railroad crossings were handled in a different manner from the manganese crossings. These were planked with oak instead of being paved with stone blocks. The oak planking was removed and the crossing spikes pulled and joints unbolted. These crossings were handled one at a time and the crossing being worked over was raised on steel wedges in a similar manner to the manganese crossings. The crossing was then unbolted and all knee irons, helper rails and guard rails between the rails of the street railway portion were removed. It so happened that the through rails of these crossings were on the street railway portion and not the railroad, and this fact was a large factor in our favor. The two short pieces of rail were removed and one end only of each portion was cut off the required amount and the ends shaped in the field by cutting torch to provide the new flangeway and the end connections to fit up against the through rail. Due to the fact that the filler block between the running rail and guard rail was of cast steel, this could not be cut in place successfully with the torch for the bolt holes, so an Ingersoll-Rand electric-driven tie tamper, air compressor and a standard air drill were used to drill the new holes for the angle and knee irons. The crossing was then rebolted and respiked in place and the adjoining rails between the double track and also on the railroad track were changed out to fit the new crossing.

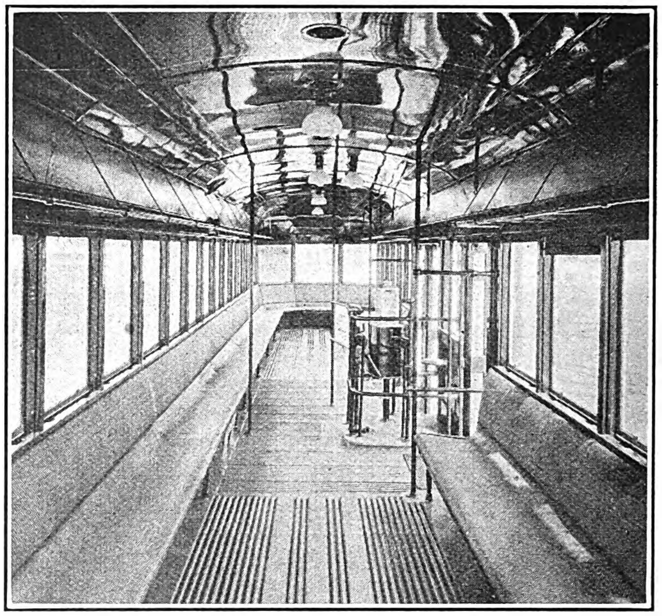
# Cleveland Builds Three-Door Trail Car

### It Is Purely for Trial—The Center Door Will Be Used for Exit or Entrance, Depending on the Direction of Travel

FOR experimental purposes only, the Cleveland Railway will shortly put in service a three-door trailer, which has just been rebuilt from a two-door trailer at the railway company's Harvard shops.

The Cleveland Railway has long been an extensive user of trail cars. Its standard trailer has two center doors, with the conductor stationed between them, on the pay-pass principle. The standard motor car with which this trailer is used is a Peter Witt design. In the trail car all seats are longitudinal, while in the motor car the front of the car has longitudinal seats and the rear has cross seats.

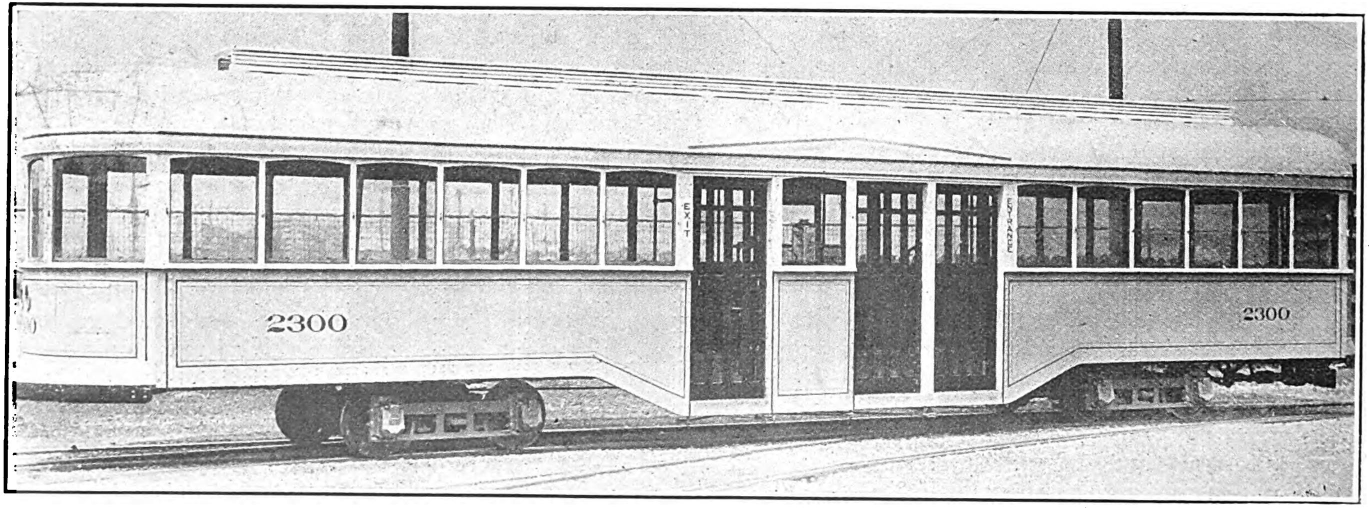
The principal structural change required when the car was rebuilt for three doors was that the side sill girder on the right hand side of the car had to be bent down for a longer distance, to accommodate three doors instead of two. Actually the side sill was cut and spliced to gain this distance. No change was required in the left-hand side sill, because the car is single-ended.



A Reversible Partition Is Adjusted to Guide Passengers Entering or Leaving Through Middle Door

Each of the three doors is double, each half being in two parts and arranged to fold outward when the door is opened. The opening between door posts is 30 in., but as the doors are 1 in. thick and double back on each side, the opening in the clear for each door is 26 in. The length of the car over all is 49 ft., and the width over all is 8 ft. 4 in.

The three doors will be used like the three doors of the Toronto three-door trailer, described in the ELECTRIC RAILWAY JOURNAL for June 23, 1923, page 1033. The door nearest the front will always be used for entrance, that nearest the rear for exit and the middle door for exit inbound and entrance outbound. To aid the passenger in understanding this varied use of the center door there is a swinging barrier within the car, as in Toronto, which indicates whether the center door shall be used as an entrance or an exit. This barrier is operated mechanically in the Cleveland car, the conductor changing it from one position to the other through a pedal, mounted in the pedestal of his fare box, whereas in Toronto a hand lever is used. The three doors are also opened and closed mechanically in Cleveland instead of by air as in Toronto, the doors in Cleveland being operated by crank levers.



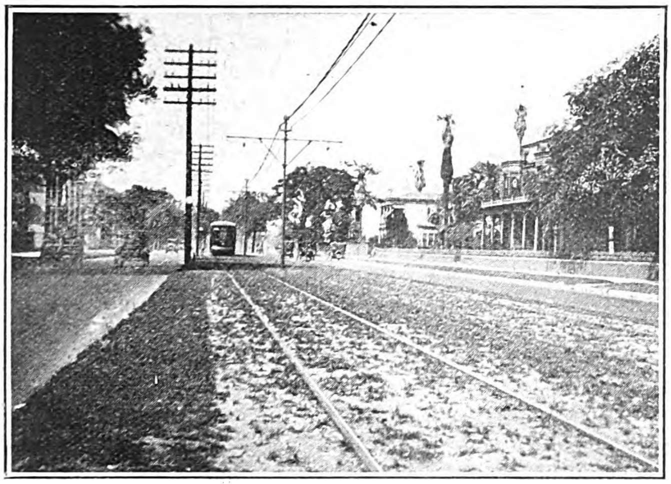
The New Cleveland Trailer Has Three Doors, the Middle One Being Used for Entrance or Exit

# How New Orleans Is Rebuilding Track

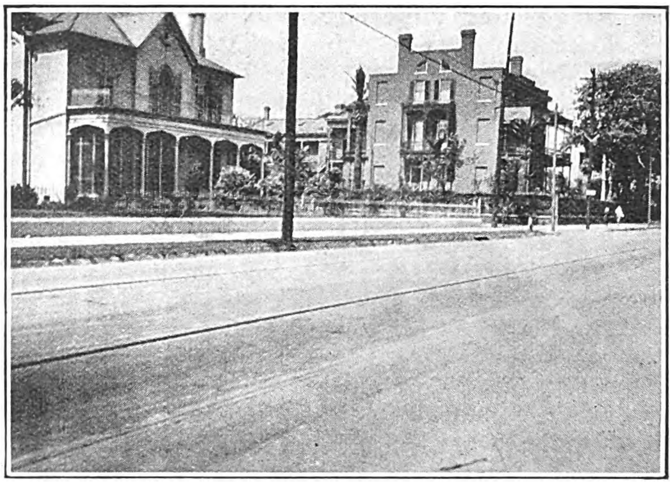
### The Aim Has Been a Substantial Structure that Will Last Well in Spite of Poor Drainage and Unfavorable Climatic Conditions—Special Effort Has Been Made to Give Mobility to the Track Machinery

TWO factors make the track reconstruction practices of the New Orleans Public Service, Inc., of unusual interest to electric railway men. In the first place, drainage and climatic conditions in New Orleans are such that the design of a lasting track structure is a difficult problem. In the second place, an extensive reconstruction program is under way and much thought has been devoted to the selection of methods and equipment to perform this work in the most efficient manner.

The equivalent of approximately 9 miles of single track is at present under construction in New Orleans. Seven miles of this is reconstruction of existing trackage and 2 miles extensions. More men are now employed in the track department of the company than ever before. Much modern equipment and labor-saving machinery are in use on the various jobs.



Much of the Track in New Orleans Is Laid in "Neutral Ground," Where T-Rail and Open Construction Are Used



Prytania Street, Where Heavy Vehicular Traffic Necessitates the Use of a Substantial Track Structure

The natural ground surface of the entire city lies considerably below the level of the Mississippi River and Lake Pontchartrain. This seriously complicates the drainage problem and necessitates the continuous operation of pumping stations to lift the run-off water up to the lake level for disposal. Some of the streets have underground drainage systems, but many of the older streets rely entirely on surface drainage. The run-off water eventually reaches one of the various canals, of which the city has a considerable number, and follows that route to a pumping station. As might be expected under these circumstances, the subsoil is damp and somewhat unstable, although the continuous drainage has improved conditions materially in the last few years. The greatest care must be exercised in the design of a track structure if it is to withstand heavy traffic.

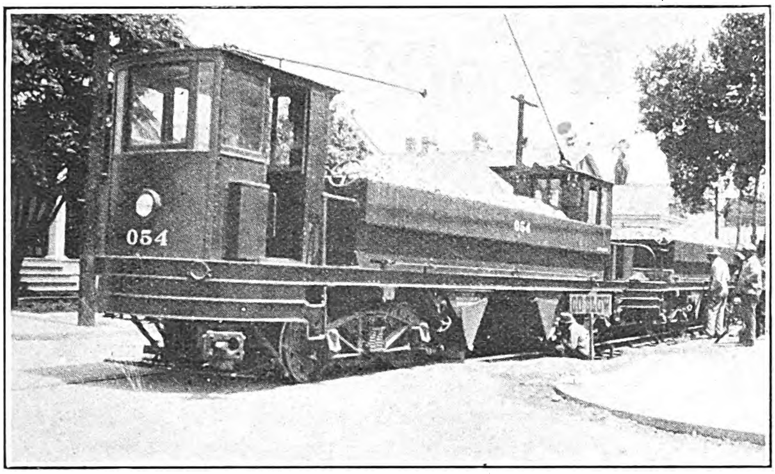
Three general types of construction are used in New Orleans. The most substantial of these is a standard concrete construction used in paved streets where the track can be taken out of service during the progress of the work. Where the track must remain continuously in service, a combination concrete and slag ballast track construction is used. In the so-called "neutral ground" or reservation in the center of many of the streets an entirely different type of structure is used, employing only slag ballast and using T-rail.

#### TIES SPACED TO GIVE EXTRA JOINT SUPPORT

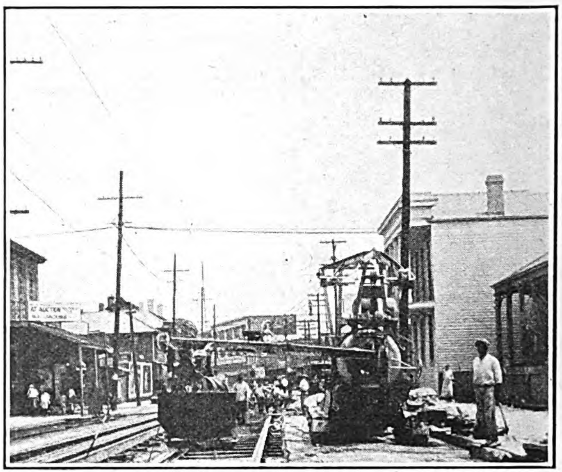
Where the work can be done without interruption by traffic, the design calls for 7-in., 122-lb. grooved girder rail, 66 ft. long, creosoted wood ties and a monolithic concrete base. Joints are staggered 33 ft. apart. An interesting spacing of ties is used with this type of construction. On each side of the joint a tie is placed 9 in. from the end of the rail, making an 18-in. spacing. The next tie is 26 in. away, the third 32 in., the fourth 36 in. and the remaining five ties are spaced on 38-in. centers, when the spaces are reduced in reverse order approaching the next joint. Flat tie plates are used immediately under the joint, but the second tie on each side has a combination plate. On the four ties immediately opposite the joint, combination tie and brace plates ½ in. x 7 in. x 11 in. are used. Elsewhere along the length of the rail flat plates and combination tie and brace plates are alternated.

After the excavation has been made the finished sub-grade is thoroughly rolled with a 5-ton roller. In case any low or soft spots are revealed they are filled with earth and rolled again until thoroughly compacted. The trench is made 6 in. deeper under the ties than elsewhere, a diagonal cut being made from the general level of the bottom of the trench to the bottom of this deeper excavation, as shown in an accompanying drawing. There is, therefore, a minimum of 6 in. of concrete everywhere underneath the tie.

Creosoted wood ties, 6 in. x 8 in. x 8 ft., are used. The rails are fastened to the ties through each tie plate, whether flat or combination, by two spikes, stag-



Slag Ballast Being Unloaded Into the Trench from a Differential Dump Train



A Concrete Mixer on a Tractor Mounting Moves Alongside Track as Work Progresses

gered. Spikes are driven vertically, rather than in a slanting direction, the last blow forcing the head toward the rail base. Foremen are especially cautioned to see that spikes are driven thoroughly home.

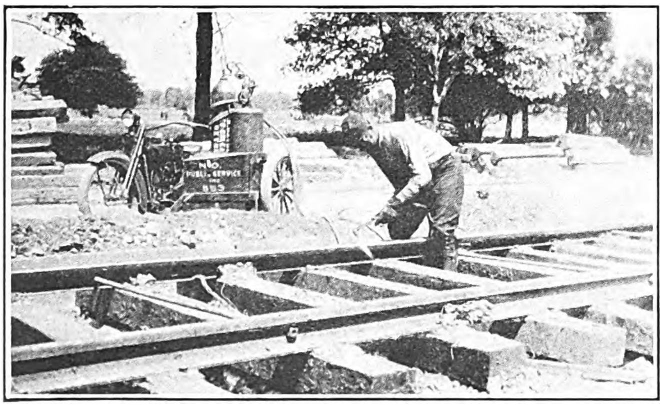
All joints are full bolted, using special 26-in. machine-cut joint plates 1¼ in. thick, made by the Bethlehem Steel Company. Six bolts are used, spaced 2½ in., 4 in., 4 in. An unusual feature of the company's joint practice is that with grooved girder rail the heads of the bolts are on the outside and nuts are on the inside of the rail. The advantage of having the nut on the inside is that there is more room under the lip of the rail than under the head and the nut does not interfere with the granite paving blocks. A lock washer is used under each nut. This arrangement of bolts and nuts is shown in an accompanying illustration.

After the joints have been bolted and tightened up they are seam-welded. For this work the company has a number of Rail Welding & Bonding machines. These are mounted on Dodge trucks, the bodies having been built by the railway and equipped with convenient tool chests and lockers for the men. Compromise joints are bonded with steel terminal bonds electrically welded. All track is cross-bonded at 300-ft. intervals with 300,000 circ.mil cable and at each end of the job with 600,000 circ.mil cable. Welding and bonding are done just in advance of the concrete mixers. The top seam weld is then ground down.

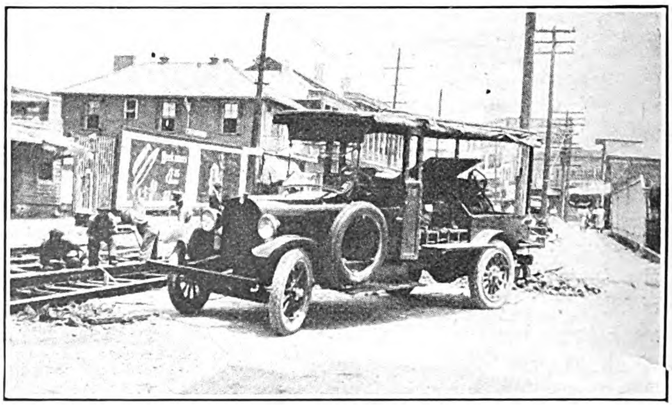
Before pouring the concrete the track is carefully lined up and set to grade. Concrete is mixed in the proportions of 1-2-4. In practice the method is to use one sack of cement, one wheelbarrow of sand and two wheelbarrows of gravel. Foremen see that these proportions are strictly adhered to. The material is thoroughly mixed in a Koehring mixer for a period of not less than one minute, after which it is immediately emptied from the mixer and placed in the trench. Concrete is poured in a monolithic mass and carried to a level 5 in. below the lip of the rail. Just sufficient water to form a stiff paste is employed in the mixture. For this work a portable concrete mixer is used and is moved along the track as the work progresses. After the concrete has set it is kept wet for a period of at least ten days.

The paving on heavy traffic streets consists of granite blocks, laid on a cushion of 1 to 3 cement and sand mixed dry. The blocks are laid on this cushion with a hammer, thoroughly tamped and wet down in order to set the cement in the paving cushion. After the water has evaporated, a coat of 1½:2½ asphalt and sand is applied. Asphalt (40-45) heated to 365 deg. F. is mixed with sand heated to 400 deg. F. and squeegeed thoroughly into all the seams. The granite blocks are then tamped lightly and the surface is sprinkled with a coat of hot sand.

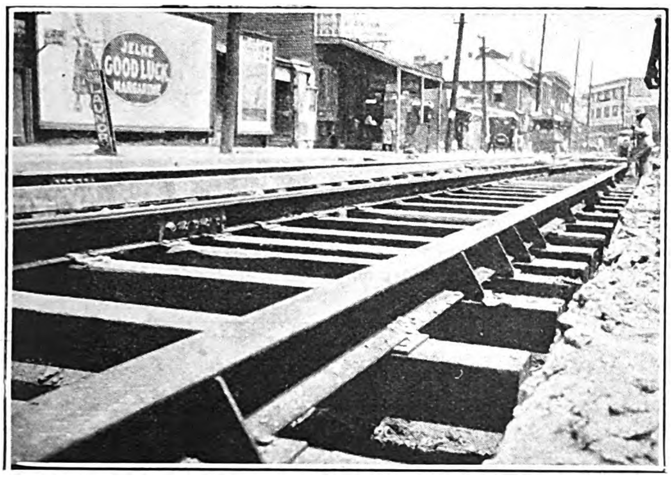
This method produces the so-called mastic pavement, described in detail in ELECTRIC RAILWAY JOURNAL, March 17, 1923, page 481. Results with this type of pavement in New Orleans have been very satisfactory. Under traffic the mastic seems to harden and gives a smooth, quiet and durable surface. An example of mastic pavement that has been in use about two years



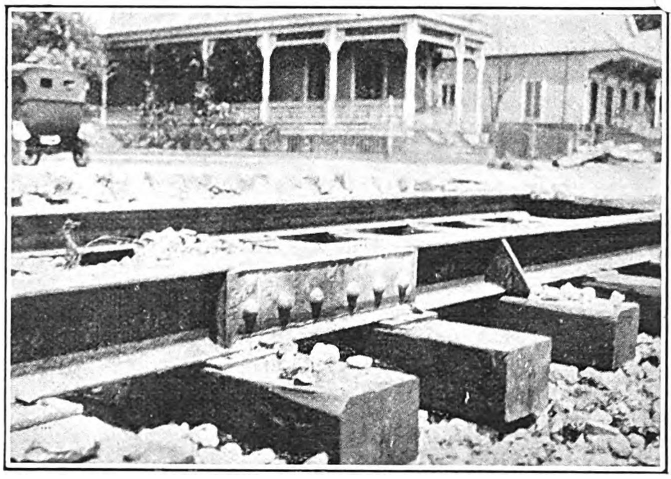
Acetylene Welding Outfits Have Been Mounted on Motorcycle Side Cars to Facilitate Movement from Place to Place



Welding Joints with a Rail Welding & Bonding Machine Carried on a Dodge Truck



The Rail Opposite the Joint Is Held in Position by Four Brace Plates



Bolt Heads Are Placed on the Outside and Nuts on the Inside Where Grooved Girder Rail Is Used

on Prytania Street is shown in an accompanying picture. This street parallels the famous St. Charles Avenue, one block away, and since the exclusion of heavy trucking from that thoroughfare, it has been subjected to severe traffic. The mastic pavement, however, remains in excellent condition.

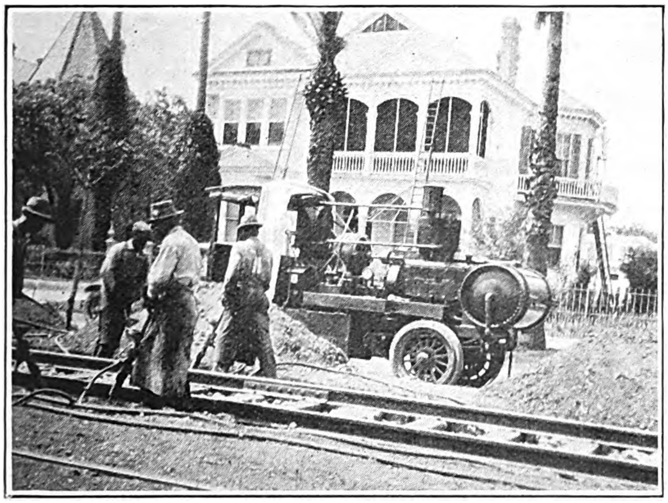
Granite blocks used by the railway in paving work are recut, at a cost of 4 cents apiece, in the company's stone yard. Much granite in large sizes is available from old pavements that have been taken up. These are the original blocks that were brought over from France in the early days of the city. This is taken to the railway yard, where two stonecutters recut it to standard size. In an eight-hour day a man can cut 180 blocks. Wages are 90 cents per hour.

### CONSTRUCTION UNDER TRAFFIC

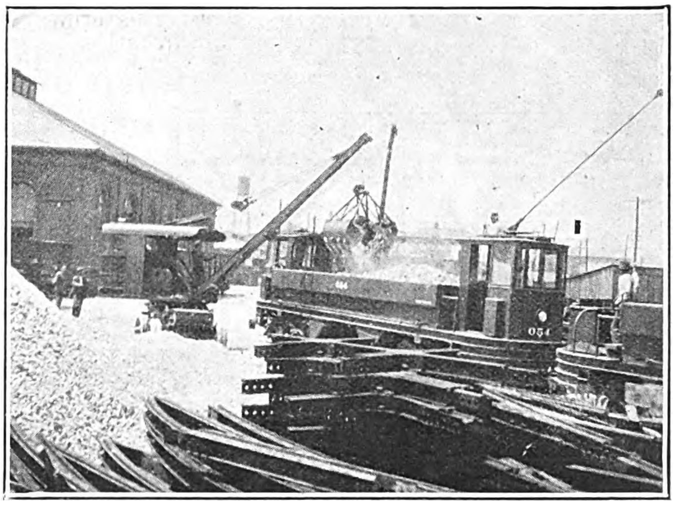
Where it is necessary to construct track without interruption to traffic a somewhat different method is followed. Instead of using monolithic concrete structure, slag ballast is employed on a concrete foundation. Underneath the ballast is an 8-in. concrete slab. This is mixed and poured in the way already described for construction not under traffic. To keep the track in running order, the rails are spiked to the ties and then the track is lifted and supported from the adjacent structure by old rails laid crosswise. Then the concrete is poured and allowed to set for a period of 10 days.

The slag is obtained cheaply from the steel mills at Birmingham, Ala., and its handling is an interesting phase of the work of the track department at New Orleans. It is loaded from the pile in the storage yard into work trains for transportation to the job. The loading is done by means of a Universal crane mounted on a four-wheel drive Commercial electric truck. The ballast is carried by trains of Differential center dump cars directly to the place where the work is in progress. A train runs slowly over the new rails, dropping the ballast into position as it moves along. Under each tie is placed 4 in. of slag, which is tamped with Ingersoll-Rand pneumatic tampers. The total depth of ballast is 6 in., giving it a 2-in. exposure above the tie.

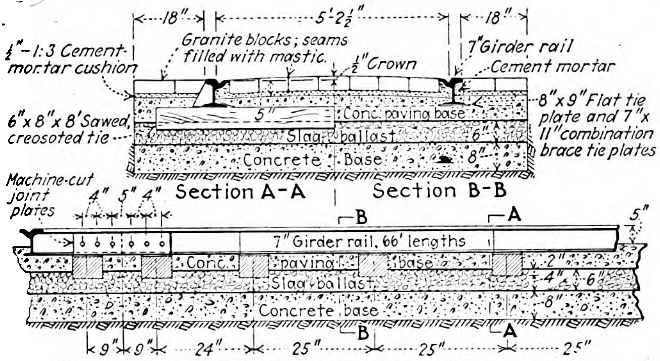
A somewhat different spacing of ties is here used, although the same 7-in., 122-lb. grooved girder rail is the standard for this kind of construction. The joints are staggered 33 ft. apart, and in this case also the first two ties at the joint are spaced 18 in. between centers. The intervals then run one of 24-in., four of 25-in., five of 26-in. centers, and then a reduction again as the next joint is approached. All ties are placed with the heart down. Combination tie and brace plates are used on the four ties at the joints, as in the other construction, and elsewhere the tie plates and brace plates are alternated.



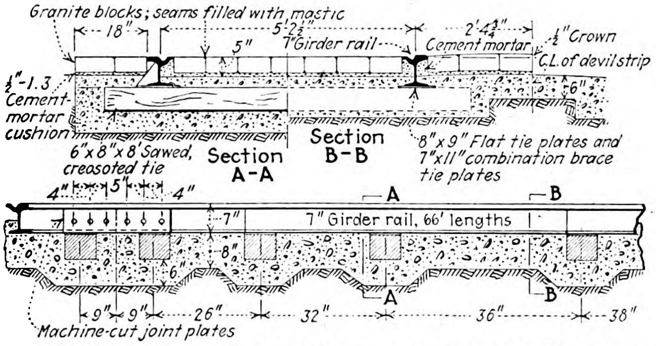
A Westinghouse Compressor on an Electric Truck Supplies Air to the Ingersoll-Rand Tie Tampers



Universal Crane Loading Ballast at the Storage Yard of the Track Department


18"
5'-2½"
18"
½"-1:3 Cement-mortar cushion
Granite blocks; seams filled with mastic
½" Crown
7" Girder rail
Cement mortar
6"x8"x8' Sawed, creosoted tie
5"
Conc. paving base
Slag ballast
6"
Concrete Base
8"
8"x9" Flat tie plate and 7"x11" combination brace tie plates
Machine-cut joint plates
4" 5" 4"
Section A-A
Section B-B
B
A
5"
7" Girder rail, 66' lengths
Conc. paving base
Slag ballast
Concrete base
2"
4"
6"
8"
9" 9" 24" 25" 25" 25"

**Type of Track Structure, Using Slag Ballast, Which Is Built Under Traffic**


Granite blocks; seams filled with mastic
18"
5'-2½"
2'-4⅞"
½" Crown
5"
7" Girder rail
Cement mortar
C.L. of devil strip
½"-1:3 Cement-mortar cushion
6"
6"x8"x8' Sawed, creosoted tie
Section A-A
Section B-B
8"x9" Flat tie plates and 7"x11" combination brace tie plates
4" 5" 4"
A
B
7"
7" Girder rail, 66' lengths
8"
6
9" 9" 26" 32" 36" 38"
Machine-cut joint plates

**Monolithic Construction, Used When Track Can Be Taken Out of Service During the Work**

Welding and bonding are done in the same way as with the monolithic concrete structure. A paving base of 1-2-4 concrete, 6 in. thick, is poured on top of the ballast after the latter has been thoroughly tamped. On this base the granite block mastic pavement is then laid.

In the neutral ground, of which there are many miles in New Orleans, standard open track construction is employed. Creosoted ties and T-rail are used on slag ballast. This construction is cheap and it is easily maintained.

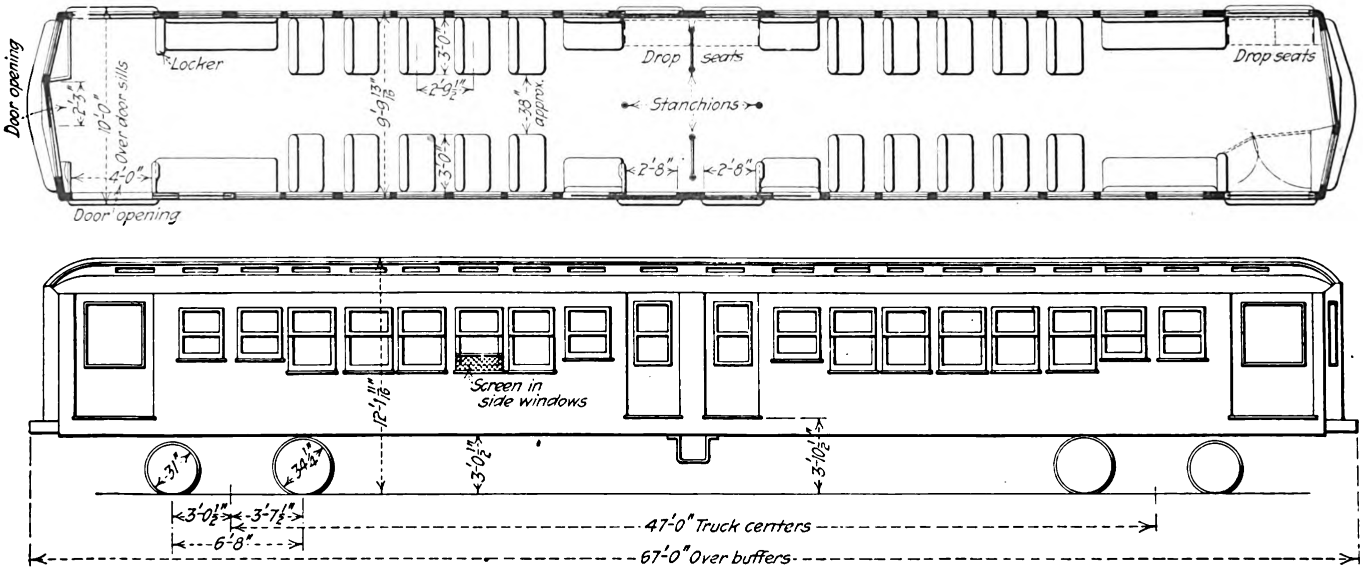
Problems are presented, however, by the intersections of cross streets and the neutral ground. The track grade is considerably higher in the neutral ground than the grade of any of the cross streets, and must, therefore, be brought down somewhat at an intersection. At the same time the grade at the cross street is raised to meet that of the tracks. This part of the track structure is subject, therefore, to particularly heavy wear and a concrete foundation is placed under the entire intersection to support the track structure and the adjacent paving.

In all phases of the work of the track department much use is made of labor-saving machinery and equipment. Besides the use of the Universal crane with Differential dump trains already described, a Marion excavating shovel in the storage yard has been equipped with a boom and bucket, enabling it to perform similar work when it is not needed elsewhere for excavating. A Brownhoist is now being mounted on an electric flat car for the use of the track department. The Universal crane is used also on the street to load waste material into work trains for disposal. Ingersoll-Rand pneumatic pavement cutters and tie tampers are employed, the compressed air being furnished by a Westinghouse compressor of 110 cu.ft. capacity mounted on an electric truck. This equipment has been arranged for easy movement from place to place. Old rails are cut by an acetylene torch, the tanks being mounted on a motorcycle side car of special design, as shown in an accompanying illustration. Electric welding outfits have been mounted on motor cars to facilitate their movement from one job to another. Tractor mounting is used with concrete mixers. It has been found that a considerable saving of time and money results from the use of this equipment, and that the efficiency of the work is promoted by thus giving mobility to the machinery.

## Staten Island Line to Electrify

### Multiple-Unit Trains Will Be Operated on 600-Volt Third Rail—Details of the Contact Line and Cars Are Given

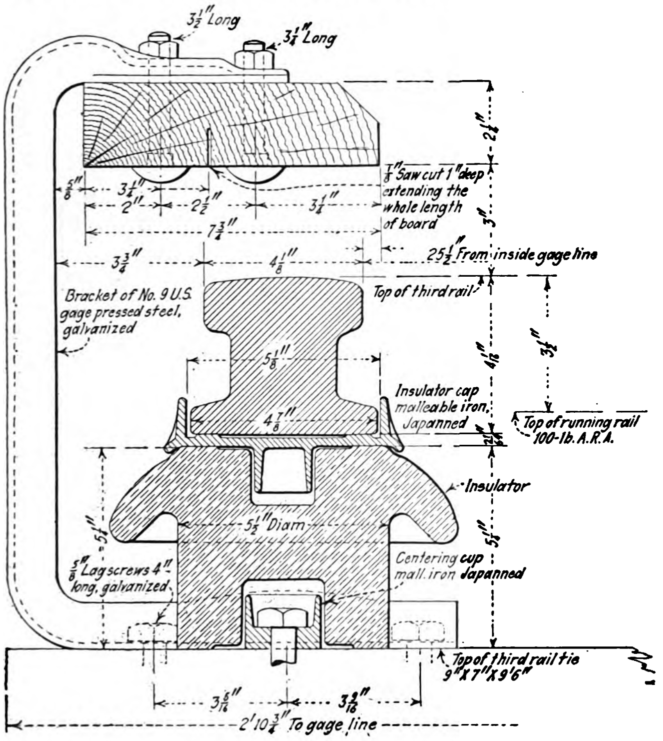
PLANS are well under way for the electrification of the Staten Island Rapid Transit Railway, St. George, Staten Island. This railroad now furnishes rapid transit steam railroad service over a system covering the shore lines of Staten Island, which constitutes the Borough of Richmond, New York City. The portion to be electrified at the present time comprises about 40


Door opening
Locker
2'-3"
10'-0" Over door sills
4'-0"
Door opening
9'-9 13/16"
3'-0"
2'-9½"
38" approx.
Drop seats
Stanchions
2'-8"
2'-8"
Drop seats
Screen in side windows
12'-1 11/16"
3'-0½"
3'-10½"
31"
34½"
3'-0½"
3'-7½"
6'-8"
47'-0" Truck centers
67'-0" Over buffers

**The Proposed Staten Island Multiple-Unit Cars Seat 71 and Will Be Operated in Trains of Six or Seven**

miles of track and includes the passenger service on the East Shore Division and the Perth Amboy Division, consisting of lines between St. George, South Beach and Tottenville.

The direct-current third rail system will be employed, at a nominal working pressure of 600 volts. The preliminary plans, which received the approval of the Public Service Commission, State of New York, May 1, call for the over-running protected type of third rail, with a special high-conductivity 150-lb. section, similar to that in use on other rapid transit lines in New York City. The location of the third rail and the arrangement of the protection are shown in one of the accompanying drawings. Standard glazed porcelain insulators with japanned malleable iron caps will be used to support the rail, which is so heavy that it does not require additional anchoring. The insulators will be held in position by japanned malleable iron centering cups, held to the ties by lag screws.


3½" Long
3¼" Long
2¼"
⅛" Saw cut 1" deep extending the whole length of board
⅝"
3¼"
2"
2½"
3¼"
7¾"
3"
3¾"
4⅛"
25½" From inside gage line
Top of third rail
Bracket of No. 9 U.S. gage pressed steel, galvanized
5⅛"
4¹⁄₁₆"
3½"
Insulator cap malleable iron, Japanned
4⅞"
Top of running rail 100-lb. A.R.A.
Insulator
5¼"
5½" Diam
5½"
⅝" Lag screws 4" long, galvanized
Centering cup mall. iron Japanned
Top of third rail tie 9"X7"X9'6"
3⁵⁄₁₆"
3⁹⁄₁₆"
2'10¾" To gage line

Section of Third Rail, Insulator and Protection Board for Staten Island Electrification

The third rail ties are 9 in. x 7 in. x 9 ft. 6 in. long and project 2 ft. 10¾ in. from the gage line of the track rail. The center line of the insulator will be 3 in. from the left edge of the tie, in order to leave room for the bracket supporting the protection board, the center of which will be 3½ in. from the line of the insulator. This bracket will be of pressed steel and will be held to the tie with two lag screws.

Previous to the electrification the present 75-lb. and 80-lb. track rails will be replaced by 100-lb. A.R.A. standard T-rails, and the section between Prince's Bay and Pleasant Plains, which now is single track, will be double tracked and grade crossings will be eliminated.

The type of car which probably will be adopted is shown in another illustration. It is a multiple-unit car of all-steel construction, approximately 67 ft. long and 10 ft. wide over the door sills. The width at the eaves will be 9 ft. 11 in., and over the monitor deck 5 ft. 9¼ in. It will seat 71 passengers. There will be double doors at the center and a wide side door at either end of the car. These doors will be electro-pneumatically operated. In addition there will be doors in the ends of the cars to permit passing between the cars. Each car will be equipped with two motors. A novel feature in multiple-unit construction is the use of a form of maximum-traction truck, there being a pair of driving wheels of 34½-in. diameter and a pair of trailer wheels of 31-in. diameter on each truck. The truck bolster will be offset 3½ in. from the center line, as shown in the drawing. Multiple-unit control will be installed to permit operation of trains of from one to ten cars, and initially the longest trains will be of six or seven cars.

While the source of electric power has not been definitely decided on, it is probable that energy will be purchased from the Staten Island Edison Corporation. The tentative plans cover a 33,000-volt, three-phase, 60-cycle power supply, to be delivered to substations erected by the railway, where the high-tension current will be stepped down and converted to direct current at 600 volts. Several of the substations will be of the automatic or remote control type, and the proposed substation layout is designed to provide power facilities for a considerable increase over present requirements.

The change to electric operation will necessitate the installation of practically an entire new signal system, the present direct-current signals being replaced by a modern alternating-current signal system.

The electrification will result in a substantial increase in schedule speed of the trains as compared with the present steam service and will afford a high-class rapid transit service to the rapidly growing residential districts of the island.

The Staten Island Rapid Transit Railway is owned by the Baltimore & Ohio Railroad and the electrification is being handled under the direction of J. H. Davis, electrical engineer of that company.

## One Year Tests of Ciment Fondu

FIGURES announced by the Boston Elevated Railway for tensile tests of Ciment Fondu mortar made in the proportions of 1 to 3 show an average strength of 454 lb. per square inch at the end of one year. This is slightly less than at the end of nine months but somewhat greater than at the end of six months. From these laboratory tests it would appear that the tensile strength is holding up fairly well. Experience with Ciment Fondu grout used in paving, however, has not been entirely satisfactory, as told in the ELECTRIC RAILWAY JOURNAL, April 19, 1924. Tests made to date average as follows:

| Length of Time | Tensile Strength per Square Inch | Length of Time | Tensile Strength per Square Inch |
|---|---|---|---|
| 1 day | 357 lb. | 28 days | 434 lb. |
| 2 days | 385 lb. | 3 months | 459 lb. |
| 4 days | 461 lb. | 6 months | 444 lb. |
| 7 days | 486 lb. | 9 months | 475 lb. |
| 14 days | 503 lb. | 1 year | 454 lb. |

## Keeping Babbitt Mandrels from Sticking

IT IS common practice to allow a slight taper on mandrels used in babbitting bearings to facilitate removal. Some roads dip the bearings in a thin batter of fire clay about every fourth time they are used to prevent sticking and also to prevent any tendency toward blow holes. Another method used by some railways to prevent babbitt from sticking is to oil the mandrels every morning before starting to babbitt the bearings.

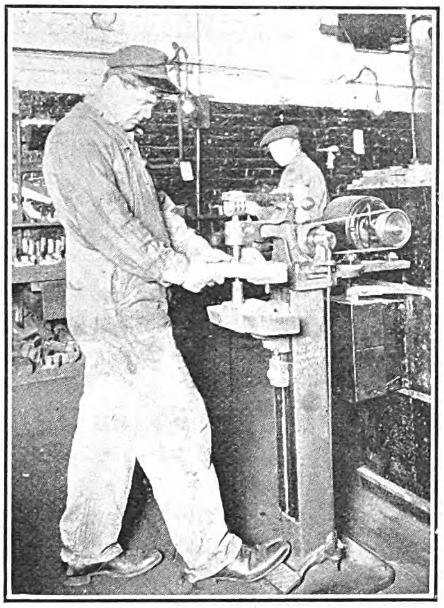
# Equipment Maintenance Notes

## Machine Drives Five Rivets to One by Hand

By O. H. Jorgensen

Chief Draftsman, Equipment Department, Chicago Surface Lines

For the manufacture and repair of brush-holder yokes, gear cases, trolley harps, fenders and many other jobs requiring a number of small rivets to be driven, a high-speed riveting machine of the type shown in the accompanying illustration, taken in the West shops of the Chicago Surface Lines, has been found to make very substantial savings in time.



High-Speed Riveting Hammer Which Saves Time in the West Shops of the Chicago Surface Lines on a Large Variety of Work

In making up brush-holder yokes of the type shown in the illustration, four $\frac{5}{16}$-in. diameter rivets are driven cold in $1\frac{1}{2}$ minutes as compared with 8 minutes taken to drive the same number by hand. These figures were derived from actual time studies of the operations.

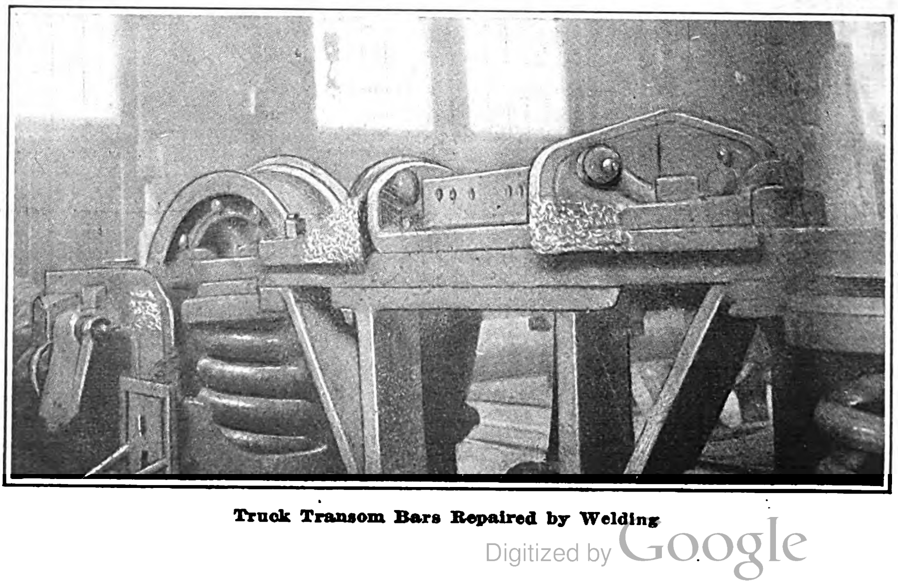
The machine used is a size 2-AHD hammer manufactured by the High Speed Hammer Company of Rochester, N. Y. It is used to drive rivets up to $\frac{5}{16}$ in. diameter cold and is designed for the purpose of reproducing the flexible blow of a hammer driven by the human arm. A hickory helve with interposed rubber cushions is used to produce this result.

Power is furnished by an individual $\frac{1}{2}$-hp. motor, running at 1,800 r.p.m. on 500 volts, and is transmitted through a belt and pulley from the motor to a crankshaft, and thence through a connecting rod and heavy rubber cushions to one end of the hickory helve. The other end of the helve carries the peen. The speed and intensity of the blows are controlled from a pedal so that a number of light blows may be delivered at slow speed, or a series of sharp blows may be struck at high speed. The peen may be shaped to form any shape of rivet head desired. While the rivet is being formed, the peen revolves so as to impart a finished surface to the heads.

## Welding Truck Transom Bars

Some of the truck transom bars have broken on St. Louis type 60-1 trucks in service on the lines of the Philadelphia & Western Railway, Norristown, Pa. These transom bars consist of forged steel, bent at the ends to follow along the top of the truck side bars. The breaking takes place just at this bend.

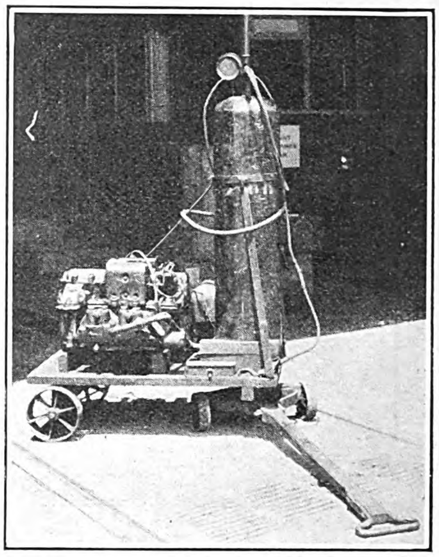
In repairing these the break is grooved out with an acetylene torch so as to provide space for adding metal. This groove is then filled in by welding, and additional metal is also deposited so as to give a larger cross-section than that of the original bars. The time necessary for making repairs to a pair of truck transom bars is about five hours.



Truck Transom Bars Repaired by Welding

## Portable Compressor Outfit to Clean Cars

A handy apparatus for blowing the dust out of controllers, switches, etc., has been constructed by the Knoxville Power & Light Company, Knoxville, Tenn., from old equipment on condemned cars. The apparatus consists of an AA1, 550-volt, motor-driven Christenson compressor, an Allis-Chalmers governor and a compressed air tank equipped with a pressure gage.



Portable Compressor Outfit Used in Knoxville for Blowing Out Controllers, Etc.

These have all been mounted on a

# Dick Prescott Meets the Boss

## And so does Mullaney

NOTICE
GENERAL FOREMAN

UPON swinging around in his chair, after his telephone conversation with Thomas Mullaney, Steve White recognized Mr. Milburn, the new general manager of the Consolidated Railway & Light Company, as he had seen a photograph of him in the daily paper. In spite of repeated differences with Mullaney, Steve was intensely loyal to his immediate superior, and he flushed profusely as he realized that his statements had undoubtedly been heard by the G.M.

Mr. Milburn was the first to speak and cleared the situation for the moment by appearing to ignore the remarks he had just heard.

"Will you kindly direct me to Mr. Mullaney's office?"

By this time Steve had succeeded in getting to his feet and this seemed to bring back the power of speech.

"Oh—Why—Yes!—Mr. Milburn—Sure!—"

Steve was trying hard to collect himself. He had a powerful desire to get out of the presence of the "boss" until he could get a moment to think, and he therefore turned suddenly to Dick, who had remained standing respectfully silent.

"Dick, take Mr. Milburn right over to Mr. Mullaney's office."

The general manager stepped back from the door and Dick quickly joined him, saying as they moved off from the carpenter shop office, "Mr. Mullaney's office is over on the other side of the shop, Mr. Milburn, and we'll have to go through this way" (motioning to the large door leading out of the carpenter shop building).

As they walked off, the general manager seemed in no particular hurry. He paused frequently and seemed interested in observing the manner in which certain types of repair work were performed. He stopped and from a little distance watched two men who were attempting to trim the edge of a piece of dash iron by holding it on a rail at the edge of a pit, and using a cold chisel and hammer. As they moved along through the shop, he noted the lack of heat and the bundled appearance of the men as they awkwardly went about their tasks. Neither did the gloomy appearance and the accumulated dust of years on the skylights and walls of the building escape his apparently casual glance.

In the wood mill he noted the piles of shavings on the splintered wood floor. In the machine shop he saw a workman carefully calipering a broken armature shaft in order to obtain the dimensions for the piece which he was turning in a lathe. No drawing of any kind was in sight. In the paint shop he watched a workman laboriously coating the irregular surfaces of a truck with a hand brush.

Dick walked along at the general manager's side and replied as fully as he was able to several questions put to him regarding some of these operations. He explained that he had only recently been forced to leave his engineering studies and accept employment as a carpenter's helper, and was therefore not very familiar with the practices in the shop. As Dick replied to questions, however, the general manager turned several times and observed him keenly.

They finally reached the outer office where Dick had received some of his first impressions of the Consolidated shop. Approaching the door marked "General Foreman," Dick knocked, and in answer to the gruff "Come in," he opened the door, and stepped in after the general manager.

"Mr. Milburn, this is Mr. Mullaney. If that is all you wanted, I'll leave you here."

"Yes, that's all; thank you very much."

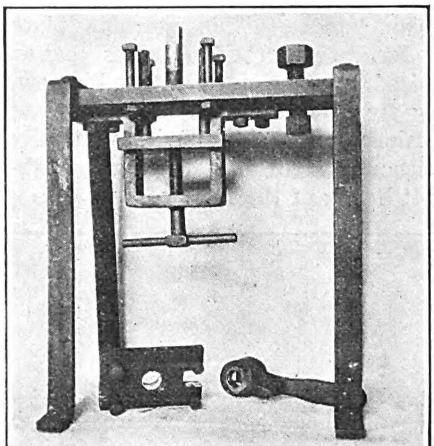
Dick Prescott withdrew, and closed the door as he came out.

small four-wheel truck, as shown in the accompanying illustration. A long pole with a fuse hooks over the trolley wire to furnish the current. Ground connection is furnished by an iron plate which is placed on the rail and is connected to the apparatus by a long, flexible cable. Because the parts were all taken from cars about to be scrapped, the apparatus was constructed at small cost. It is comparatively light in weight and can be moved easily anywhere in the shop.

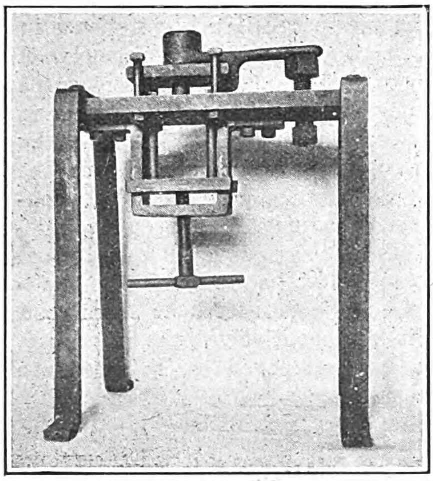
## Babbitting Air Brake Handles

MANY methods for repairing air brake handles where they fit the broached portions of the brake valve stems are used by various electric railways. When the fit becomes worn, the Eighth Avenue Railroad, New York, N. Y., is babbitting its air brake handles and is finding this a very satisfactory method. The accompanying illustration shows the type of babbitting jig used.

A plate with four strap iron legs is used to support a standard brake valve stem and the necessary attachment for accurately locating the air brake handle and providing for its removal after babbitting. A removable plate fits over the round portion of the brake valve stem and rests on top of the base plate of the jig. This smaller plate is notched out to correspond to the top of the brake valve, so that a handle placed in position will be accurately lined up and the distance from its center to the interlocking lug of the brake valve will be exactly determined. With the air brake handle in posi-



**Jig for Babbitting Air Brake Handles. The Movable Plate for Removing Handles Is in the Raised Position**



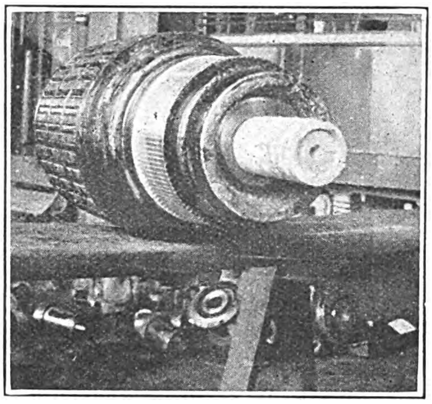
Air Brake Handle in Position on Jig Ready for Babbitting

tion, it is lined up horizontally by means of a set screw with an adjustable nut. This is used to level up the handle and insure that it is held accurately during the babbitting operation. Babbitt is then poured in at the top of the handle until an accurate fit is obtained and the entire space is filled.

In order to remove the handle after babbitting, an attachment is provided on the underside of the jig. This consists of a movable plate with two pins which project through the face plate of the jig and when raised press against the movable plate on top. The latter supports the brake valve handle. This movable plate underneath works in guides and is raised by means of a hand screw. By turning this, the movable plate pushes the brake handle vertically without danger of distorting the babbitt lining of the handle.

## Armature Shafts Built Up with Sleeves

IT IS the practice of the Nashville Railway & Light Company, Nashville, Tenn., to build up a worn armature shaft by shrinking a steel sleeve on the shaft. The sleeve is slipped on hot and allowed to cool in place, and is then turned down in a lathe to the desired size. This procedure has supplanted the welding process which was the method formerly used to build up worn armature shafts. The new method is preferred, not only because it is more economical, but also because the danger of crystallization of shaft during welding is eliminated.

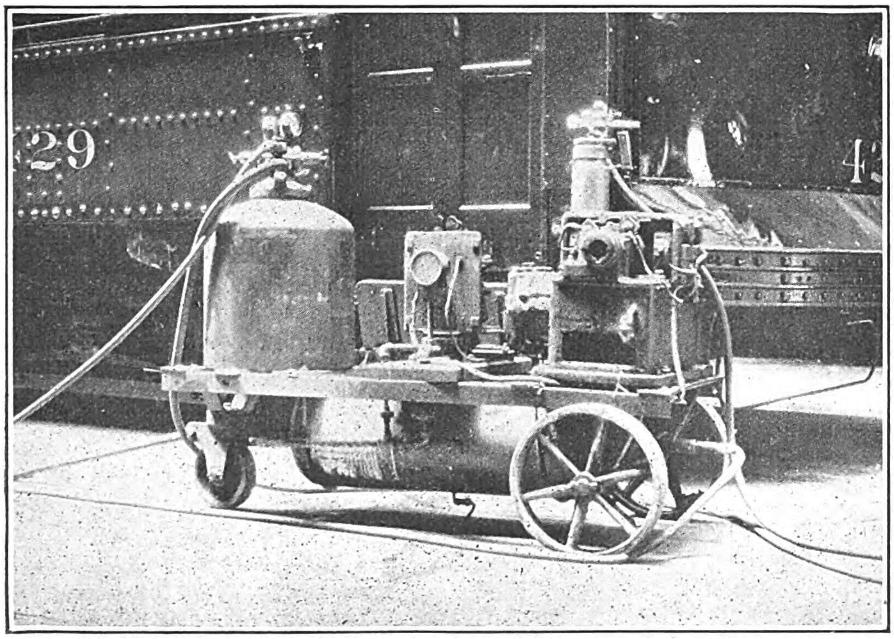


Worn Armature Shaft Restored by Shrinking on a Steel Sleeve

## Spray Painting Practice in Atlanta

A SPRAY painting outfit which is used by the Georgia Railway & Power Company, Atlanta, not only for car painting in the shop, but also at times for doing large outdoor painting jobs, has been mounted on a small truck to give it mobility. The apparatus used is the DeVilbis spray painting machine, with an old railway compressor and governor.

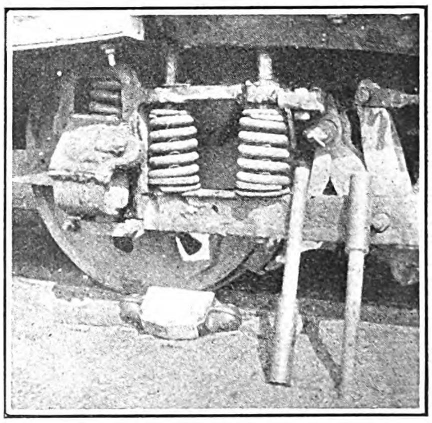
When car painting is being done, the 10-gal. paint tank is used simply as an air chamber, the paint itself being placed in a smaller container. The practice of this company is to use spray painting below the belt rail, including the trucks, and hand painting above that line. Shields of various kinds to protect the windows and sash and permit spray painting of the entire exterior have been tried but have not proved very satisfactory. Further experiments along this line are contemplated, but for the present the use of this apparatus is confined to the lower portion of the car body and trucks. Experience shows that the work formerly done in one man-day can now be done by spray painting in two man-hours.



Spray Painting Outfit Used by the Georgia Railway & Power Company Has Been Mounted on a Small Truck to Give it Mobility

## Economical Construction for Body Spring Posts

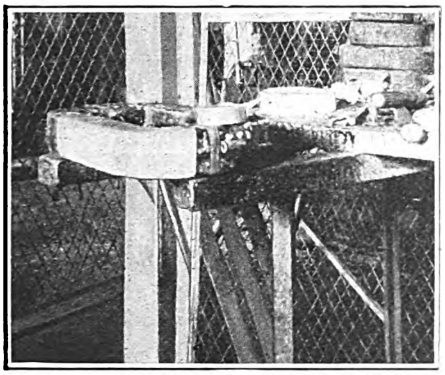
THE body spring posts for the Brill No. 22 truck consist of a top portion of 2 in. diameter, while the diameter of the bottom part of the post is but 1¼ in. Where these are made out of solid steel rods, it is necessary to turn off ⅜ in. from the bottom part. The Long Island Electric Railway, Jamaica, N. Y., experienced trouble from the breaking of these body spring posts just at the shoulder. As a washer fits against the enlarged portion and on top of the springs, a fillet could not be provided at this point. The difficulty has been overcome, however, by using a 2-in. steel tube with ⅜-in. wall for the enlarged end. This is forced on to a 1¼-in. steel rod as in-



Two Body Spring Posts and a Side Bearing Ready for Installation on a No. 22 Truck dicated in the accompanying illustration. This construction has not only overcome the breakage of the posts, but also is a more economical method than turning down the posts.

## Special Bench Rest for Taping Coils

IN ORDER that the tape may be passed inside and around a field coil while it is lying flat, a bench in the electrical repair department of the Eighth Avenue Railroad, New York, has been provided with two extension arms. The field coil to be taped is placed on these for support. The work of taping can then be carried out without any obstacle and without the necessity for part of the coil to extend over the edge of the bench unsupported. The work of taping can also be done much better with the coil flat than if on edge.



Extension Arms on Workbench Provide Convenient Means for Taping Field Coils

## Chains Hold Safety Car Motors in Place

A SIMPLE method to hold a safety car motor in place in case of breaking of the suspension bolt, some trouble from which has been experienced in the past, has been devised by the Nashville Railway & Light Company, Nashville, Tenn. After the bolt has broken the motor is free to move up or down to a certain extent. This movement has in some cases resulted in cutting the motor leads and crippling the car. To prevent this and save the necessity of pulling cars in from the road, the company has equipped all of its safety cars with chains running from the bale on the motor case to the truck frame. These chains have enough slack to allow free movement of the springs but are tight enough to prevent the motor hitting the car floor if the suspension bolt breaks.

# New Equipment Available

## A Lighter Portable Welder

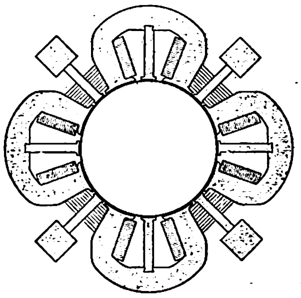
By J. C. Lincoln

Liteweld Company, Cleveland, Ohio

A DEVELOPMENT of welding and bonding equipment has recently been made by the Liteweld Company in the form of a dynamotor type welder. This type was used as it is light and efficient, and improvements in design have further increased the effectiveness of the active material while still retaining simplicity, efficiency and ruggedness.

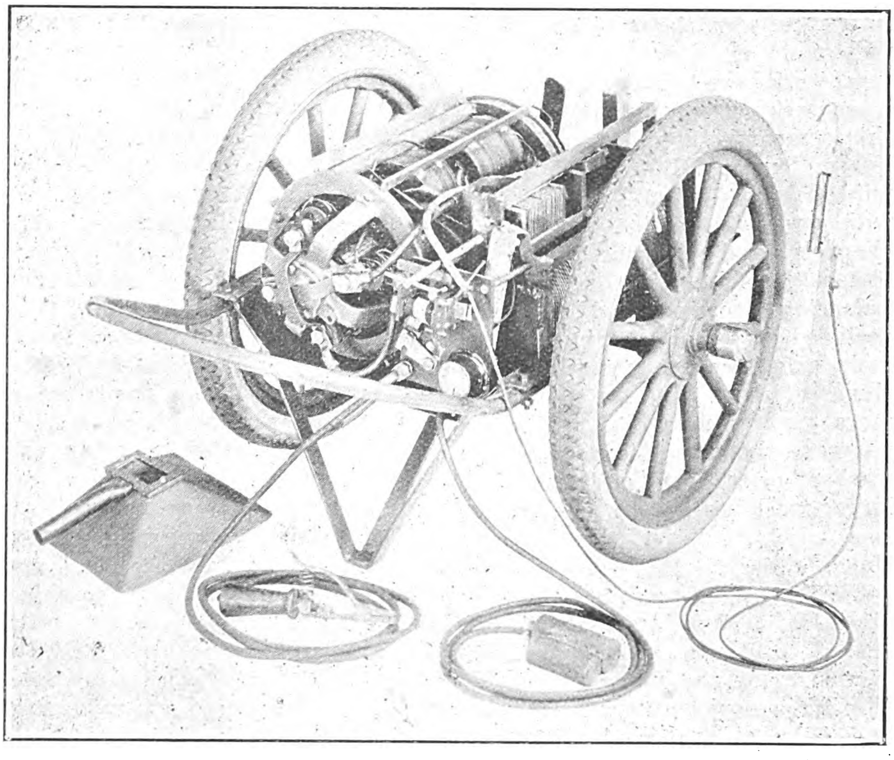
The chief modification is in the field system, which is of the "divided pole" design. In the Liteweld machine the poles are divided into three magnetically isolated parts instead of being of the usual one-piece construction. Each pole piece is made up of sections of laminations on the outside with a central section formed from a steel bar. Slots are provided in the laminations for inserting interpoles if necessary. The three sections of the pole are securely bound together by a cast non-magnetic metal of high tensile and compressive strength located between the central steel bar and the laminations on either side.

The effect of this divided pole system is best illustrated by considering the limitations of a welding dynamotor, the principal one of which is sparking. The magnetic flux in any electric motor or generator consists of two component parts, the useful flux in the pole and the armature reaction flux which tends partly to neutralize the useful flux and partly to cause destructive sparking at the brushes by shifting the proper commutating position of the armature current. In ordinary motor design this reaction flux is reduced by increasing the size of the air gap between the armature and the pole, thus making it more difficult for the reaction flux to reach the pole.



**Cross-Section of the Divided Pole Construction Used in the Magnetic Circuit**

The small stippled areas are the iron cores; the dark areas are the field coils; the large stippled areas are the non-magnetic cast material which binds the parts of the divided poles together and assists in overcoming the armature reaction flux.



Pneumatic Tire Mounting Is Provided for New "Liteweld" Welding Set

This requires a greater magnetizing force in the poles and greater power to overcome this loss and to prevent sparking. This is of particular importance in a welding machine because of the sudden surges of current.

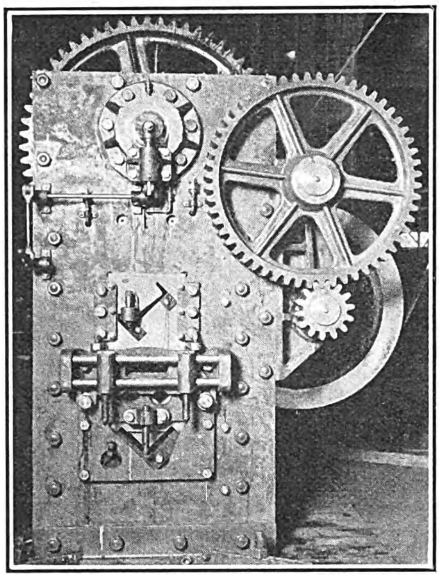
It will be seen from the accompanying diagram of the Liteweld machine that the useful flux has but a short path to travel, which is almost entirely of iron. The reaction flux has a much more difficult path to follow, as in addition to crossing the air gap twice it must pass across the non-magnetic alloy which separates the laminations from the central bar, through the central bar itself, across the section of non-magnetic alloy on the other side of the pole into the laminations adjacent to it and thence back to the armature. As its path is largely through non-magnetic material, the armature reaction flux is practically eliminated.

With this construction the air gap can be made much smaller than is the usual practice, and since nearly 80 per cent of the total magnetizing force is needed to force the flux through the non-magnetic part of the circuit, a comparatively small reduction at this point greatly reduces the number of ampere turns per field coil. This results in a smaller machine without loss of power, efficiency or reliability.

## Improved Bar Cutters

FEATURES which will appeal to the railway shop repairman as well as to those engaged in structural work have been incorporated in a new series of special bar-cutter machines manufactured by the Buffalo Forge Company, Buffalo, N. Y. A universal bar-cutter arrangement with a special section for cutting channels and I-beams, improved placement of the plunger counterbalancing springs, and a newly designed driveshaft bearing for the main shaft are common to all machines of the series. In addition, a more positive method for effecting plunger engagement is used on the smaller sized bar cutters. The larger machines have a new type of cam adjustment for the jaw-type clutch.

The bar-cutter machines range in size from a No. 5 to a No. 11. In sizes 5 to 9 engagement and disengagement of the plunger is made through a new block and ram, controlled by a counterweighted lever. This counterweight assures positive holding of the ram in either position. The new cam adjustment for the larger bar cutters, Nos. 10 and 11, is by means of a spring which controls the engagement of the clutch. This adjustable feature assures maximum speed and ease in operation.



Bar Cutter with Special Sections for Cutting Channels and I-Beams

The lower half of the bar-cutter working section can be used for cutting rounds, squares, angles, flats and tees without changing knives. The upper half of this section contains the knives for cutting channels, I-beams and other rolled sections. A special knife is required for each size channel and I-beam used. The over-all height of the machines is reduced by changing the position of the two large plunger counterbalancing springs from the top to a position inside the frame. With the new driveshaft bearing, either the flywheel or the shaft itself can be easily and removed when necessary.

All working parts of the bar cutters are accurately machined. The plunger and gears are steel castings, while the pinions are of chrome-nickel steel. The shafts are of hammered steel and run in bronze-lined bearings, while the driveshaft bearings are ring oiled. The frame is built of two armor plates securely bolted and doweled together and rigidly reinforced. The drive may be either by pulley or motor.

The cutting capacity of rounds ranges from 1 in. for the No. 5 machine to 4 in. for the No. 11 machine. Squares can be cut from ⅞ in. with the smaller machine to 3½ in. with the largest. All capacities for these machines are based on mild steel with a tensile strength of 60,000 lb. per square inch.

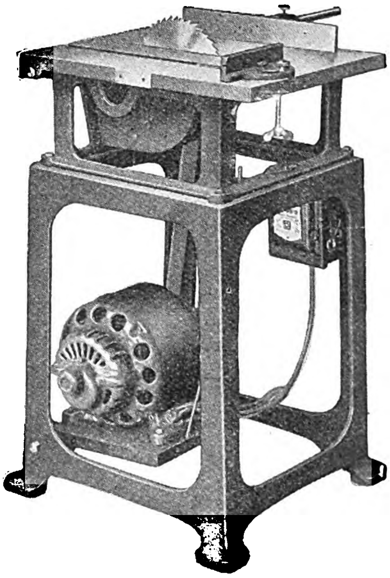
## Accurately Ground Steel Parallels

A RECENT addition to its line of precision tools has been made by the L. S. Starrett Company, Athol, Mass. This consists of sets of parallels made from a special grade of tool steel, and ground. They may be used to advantage in setting up work to be drilled, planed or milled accurately. A complete set consists of eight pairs of parallels. These may be purchased in individual pairs or combinations, as desired, for use in the tool room or machine shop. They are all 6 in. long.

## Utility Saw Cuts Either Wood or Metal

A HEAVY duty general utility saw is being marketed by William B. & John E. Boice, Toledo, Ohio. This is arranged to swing saws as large as 8 in. diameter and will cut 2½-in. stock. The table is 16 x 20 in., and elevates for grooving. Attachments are provided for boring with an adjustable boring table, and for sanding, grinding, etc. The saw arbor is arranged to take standard wood machine bits with ½-in. straight shank or regular drill chucks. The machine is equipped with large bronze bearings and the shaft is ground accurately.

The motor required is from ⅓ to ¾ hp., depending on the diameter of saw used. The height of the machine complete as illustrated is 33 in., but the operating part is sold separately for bench mounting without base or motor. The height of the upper section is 8½ in.



Utility Saw with Attachments for Boring and Grinding

# Association News & Discussions

## Improvements in Arc-Welded Rail Joints*

### Recent Developments in the Method of Welding Joint Plates by Means of the Carbon Arc Process, and Tests on Several Types of Joints, Are Described

By R. B. FEHR
Development Engineer Rail Welding & Bonding Company,
Cleveland, Ohio

During the past two years an intensive investigation of the seam-welded rail joint has been made along the following lines: (1) Study of the functions of seam-welded joints and the stresses to which they are subjected; (2) improvements in the joint structure and welding processes; (3) development of a practical method for making accelerated tests on seam-welded joints; (4) comparative tests on seam-welded joints in which variations have been made in either the mechanical structure or the welding process.

This investigation has now reached the point where definite improvements have been made in the durability of the joint and in the method of installation. A report of this work will be found in the January, 1924, *Journal* of the American Welding Society. In the present paper will be discussed briefly some important matters that have not received the proper amount of attention in the past. Observations of seam-welded joints, some of which have been in excellent condition for a period of seven years, indicated that probably the chief cause of joint failures was the repeated impact caused by cupping, which in turn was principally due to faulty mechanical preparation of the joint. Our efforts were directed toward obtaining the most practical means of setting up joints, increased strength of the joint structure and improvements in the welding procedure so as to obtain not only heavier, stronger and better positioned seams, but an easier condition for welding and greater reliability of the process.

Careful analysis of joint failures has indicated that the primary cause is chiefly what is termed fatigue of the seam welds, brought about by repeated stresses due to the combination of impact, flexural and tensile stresses. Fatigue failure of metals is due to alternating or repeated stresses below the ultimate strength, or even below the elastic limit. Recent exhaustive researches conducted by Dr. D. J. McAdam, Jr., at the U. S. Naval Engineering Experiment Station and by Prof. H. F. Moore at the University of Illinois have shown that steels have an endurance limit, which is that unit stress below which the metal can withstand an indefinitely large number of reversals or repetitions of stress without failure. Evidently the rail joint should withstand not only the stresses due to flexure, temperature decrease, welding, etc., but also the repetitions of stress due to impact, and, therefore, the unit stresses in the fish-plates and seam welds should be below the endurance limit.

### IMPROVEMENTS IN JOINT STRUCTURE

The joint is primarily dependent upon its mechanical structure and preparation. The best results can only be obtained when the fish-plates are ample in length and cross-section (that is, with the proper section modulus) and when the joint is assembled so as to have good fishing areas and a complete elimination of the gap between rails, since this begins the cupping that produces impact. The ends of the rail heads should be milled and brought together under compression, and to insure compression of the rail heads it is important that the end of the rail be under-cut slightly below the bottom of the head. Immediately after the seams are welded, the joint should be ground to the contour of the rail to avoid the impact that would be caused by the passing of car wheels over irregularities in the running surface or gage line.

**Annual Convention and Exhibits**

***A. E. R. A.***

***Atlantic City, N. J.***

**October 6, 7, 8, 9, 10**

If the rail ends cannot have a good area of contact when abutted, medium hard steel inserts must be used to take care of irregularities in the ends of the rail and to fill the gap completely, with moderate compression.

In a 6-in. 100-lb. T-rail joint with fish-plates 1 in. thick and with the rail heads not properly abutted a simple calculation will show that the section modulus of the joint at the gap is only 5.0 as compared with 17.8 for the rail itself. It is, therefore, evident that a rather large unit stress can be expected in the seam welds because of the comparatively weak mechanical structure of the joint. The section modulus of rail joints can be increased by (1) elimination of gap; (2) heavier fish-plates; (3) base-plates welded to base of rail.

By the use of heavier fish-plates having economical distribution of material (that is, I or channel sections), it is reasonable to suppose that the strength and life of the joint under repetitive impact will be very greatly increased. Base-plates welded to the base of the rail acting as tension members can also be expected to increase greatly the strength and life of the joint, because the section modulus of the joint at its middle section has thus been greatly increased. In order that the life of the base-plate seams may be a maximum, it is necessary that the base-plates be installed so as to have good contact with the bottom of the rail. The seam welds will then be subjected to longitudinal stresses only, rather than to additional vertical shearing stresses caused by downward pressure from the rail.

### IMPROVEMENTS IN WELDING PROCESS

During the past year and a half a great amount of effort has been expended on the development of a welding process which had for its main object the strengthening of the seam welds. Increasing the strength by adding a larger quantity and better quality of seam metal has been accomplished by what may be called the "hand-feeding process," which will be referred to as Process B, as distinguished from the present Process A, in which the filler rod is laid in position.

In the hand-feeding process the filler rod is added by hand at the discretion of the operator. After striking the carbon arc and forming a crater between fish-plate and rail, a filler rod is slowly fed in on the side of the crater toward which the arc advances. At no time is the rod advanced in front of the arc, thus obstructing the crater and interfering with the proper deposition of metal. The idea is to maintain a clean crater of slight depth, and by a sweeping action of the arc to deposit arc-fused metal in thin layers on the receding side of the crater, while the slag and other impurities are being floated off.

It has been proved by means of shop tests (wedging off fish-plates, etc.), chemical and metallographic analyses, cross-bending tests and repeated impact tests that a combined groove and ledge preparation of the fish-plate for the head seams gives a marked increase in the strength and life of the joint.

Some very remarkable results have been obtained by preheating (by the carbon arc), double welding and post-heating (by the carbon arc) in connection with Process B. The advantages resulting from pre-heating, double welding and post-heating are found to be: (1) The shrinkage stresses in the first seam weld are largely relieved by the annealing effect produced by re-tracing or double welding; (2) the grain structure of the first layer of seam metal is refined because this seam metal has been reheated to its critical temperature; (3) there is assurance that the seam welds are tapered; that is, heavy at the middle portion of the joint where the greatest stresses occur, and light at the ends of the fish-plates.

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*Abstract of paper before the Southwestern Public Service Association, New Orleans, April 22-25, 1924.

Furthermore, a coated filler welding rod has been developed which gives a superior quality of seam metal. As a consequence, the "Una" welding process has been evolved.

Briefly summarized, the improvements effected by this welding process are: (1) The arc is more easily controlled; (2) the seam metal is more easily placed in the proper position; (3) initial seam cracks are practically unknown; (4) heavier, stronger, more ductile and more homogeneous seam welds are obtained; (5) the seam welds have a much longer life under repetitive impact stresses.

It is important to pay attention to the relief of stresses due to expansion, contraction and shrinkage of seam metal which are set up in all kinds of welding operations. The carbon arc enables the welder to reduce, if not entirely eliminate, the localized stresses. This is readily accomplished by pre-heating and post-heating the ends of all seams and the adjacent portions of the rail and fish plates, by means of a long flaring arc. Recent investigation has shown that if the entire seam is re-traced by the carbon arc, the seam welds have a greatly increased life under repeated impact. This result is undoubtedly due to the annealing of the seam metal and the consequent relief of stresses.

Shrinkage of the weld metal during its solidification and subsequent cooling causes vertical tensile stresses to be set up in the fish-plates. A simple and effective means of minimizing these stresses is to bolt up the fish-plates very tightly in the first place, so that a considerable initial vertical compressive stress can be set up by means of the wedging action. Then vertical tensile stresses in the fish-plates due to shrinkage of the seams will first have to balance the vertical compressive stresses before they can cause residual tensile stresses in the fish-plates.

Staggering the seams, top, bottom, and sides, should be followed as far as practicable, so that no two seams end in the same vertical plane, thus producing a fillet effect when the joint acts as a beam. The head seams should not extend as far longitudinally as the base seams, and it is recommended that when new fish-plates are ordered, they be staggered about 2 in. longitudinally with respect to each other. When base-plates are used the seams should also be staggered with respect to each other.

The order of welding the seams should be governed by the principle that the finished joint, when cold, will tend to be concave toward the side (or top or bottom) on which the seams were welded first. The aim should be to have the welded joint slightly high at the middle, so that by the time it has been carefully ground it will be flat. Consequently, it will generally be found best to weld the base seams first only where the gap between the rail heads is not as tightly closed as it should be, so that the welded joint will be slightly high instead of low at the gap. When the gap is properly eliminated the head seams should be welded first, thereby increasing the compression and area of contact between the rail heads. In some cases it may be desirable to weld one head seam first, then the opposite base seam, then the other head seam, and finally the other base seam. In all cases a 2-ft. straight edge should be the guide in determining the best order of welding, for if it is found that the finished joint is usually slightly concave on top, the initial preparation of the joint and the order of welding must be so altered as to produce a slight convexity of the joint on the running surface after welding and before grinding.

### ACCELERATED JOINT TESTS

Chemical and metallographic analyses of the seam welds, wedging off fish-plates, cross-bending tests of welded joints and compression-shear tests of seam welds gave strong evidence of the advantages of Process B for welding joints, but none of those tests gave results as regards failures which were anything like those known to occur in service. On account of the delay that would have been caused by the building of a testing machine, it was decided to utilize only the repeated impact method of testing. Accordingly, a No. 2 automatic drop press of the Standard Machinery Company, Auburn, R. I., was adapted to use as a repetitive impact rail joint testing machine. This has a hammer weighing 250 lb. with a maximum drop of 36 in. The drop actually used in all tests was 10 in., and the hammer was allowed to fall at the rate of sixty blows per minute. The energy of the blow is approximately 200 ft.-lb. and its point of application 2 in. from the gap. This machine produced failures in joints which were similar to those observed in actual service, and the seam failures occurred within a comparatively short time. Thus the machine provided a means not only for making accelerated comparative tests, but for making accelerated progress in the development of seam welded joints.

TABLE I—SUMMARY OF REPEATED IMPACT TEST DATA—HAMMER 250 LB., DROP 10 IN

| Description of Joint | Seam Cracks at— 50,000 Blows | 100,000 Blows | 200,00 Blows | Number of Blows— Seam Cracks Started | Fish-plate Cracks Started | Maximum | Number of Joints in Average |
|---|---|---|---|---|---|---|---|
| 6-in., 100-lb., T-rail | | | | | | | |
| Process A, 24-in. x 1-in. plates | 29 | 38 | .. | 13,500 | ....... | 100,000 | 6 |
| Process B, grooved plates.... | 1 | 5 | .. | 55,000 | 93,500 | 130,000 | 9 |
| Process B, base-plates....... | 2 | 8 | 28 | 46,500 | 213,000 | 247,000 | 2 |
| 7-in., 122-lb. Grooved Rail | | | | | | | |
| Process A, 24-in. x 1-in. plates | 14 | (19) | .. | 20,000 | 95,500 | 76,600 | 4 |
| Una process, 24-in. x 1¼-in. plates.................. | 0 | 0 | 0 | (300,500) | 117,000 | 300,500 | 2 |

During the past year a large number of welded rail joints have been tested by means of the repeated impact testing machine. The test conditions and a summary of the detailed data obtained appeared in the article in the January *Journal* of the American Welding Society. These tests have proved that the seam-welded joint has been very much improved and that it is safe to assume that joints installed in accordance with the present recommended practice will have an even longer life.

Table I gives a summary of the most important results. In the T-rail joints, without base-plates, welding with Process B defers very greatly the time at which the seams begin to fail by fatigue, and the total length of seam cracks at 50,000 and 100,000 blows is much less than in the case of Process A joints. Further, the use of base-plates with 100-lb. T-rail, while not decreasing the number of seam cracks at a given number of blows, served to increase greatly the fatigue life of the fish-plates. Figures in the column marked "Maximum Blows" give a rough measure of the relative number of blows at which the joints were so badly deteriorated that they had to be removed from the testing machine.

The data obtained on the 7-in. 122-lb. groove rail joints show what can be expected when proper attention is given to the mechanical structure and preparation of the joint and to the best welding practice.

All the joints tested can be classified roughly into two groups: In one, the fish-plates had the shorter life; in the other, the seam welds had the shorter life. Process B characterizes the former group and Process A the latter. The welding process has been improved until the life of the joints is dependent upon the life of the fish-plates, rather than upon the life of the seam welds, as was formerly the case, and by relieving the stresses and increasing the section modulus of the joint at the middle its life as a whole has been greatly prolonged. For example, practically all of the Process B joints had to be removed from the hammer, not because of any excessive cracking of the seam welds, but because the fish-plates finally gave way on account of fatigue at the middle sections.

Table II gives some interesting data on the improvements made in both the welding process and filler rod. In order to minimize the many variables involved in joint welding a series of 6-in., 100-lb. T-rail joints were set up with a $\frac{1}{16}$-in. gap and with only the head seams welded, the bolts, of course, having been removed after welding.

### PRINCIPLES SUMMARIZED

As a result of this investigation the following principles can be definitely laid down as underlying the best known practice:

1. The gap between rail heads must be eliminated by bringing carefully pre-

TABLE II—REPEATED IMPACT TEST DATA—FILLER ROD USED FOR JOINT WELDING
HAMMER 250 LB., DROP 10 IN.

6-in., 100-lb. T-rail joints, $\frac{1}{16}$-in. gap, 24-in. x 1-in. fish-plates. Only head seams welded, no bolts. 2 in. of $\frac{1}{32}$-in. diameter rod per inch of seam weld.

| Description of Joint | Seam Cracks Started at | Seam Cracks at 25,000 Blows | Seam Cracks at 50,000 Blows | Maximum Blows | Number of Joints in Average |
|---|---|---|---|---|---|
| Process A, ordinary low carbon rod | 3,100 | 31 | .. | 19,400 | 4 |
| Process A, grade 10 rod | 11,600 | 18 | .. | 38,400 | 6 |
| Process B, grade 10 rod | 28,900 | 9 | 15 | 70,600 | 5 |
| Process B, Una joint rod 200 | 35,400 | 2 | 11 | 101,000 | 8 |

pared rail ends together under compression.

2. The strength of the joint as a beam must be adequate, that is, its section modulus at its middle section must be of the same order of magnitude as that of the rail.

3. Fish-plates must have ample, well-fitting fishing surfaces, and also the proper shape and size of groove for the welding of the head seams.

4. The carbon content of the fish-plates ought to be about 0.25 per cent.

5. Fish-plates should be drawn up tightly by means of bolts.

6. The welding of the seams is best carried out by means of the Una process, involving pre-heating and post-heating, single welding and double welding, and Una joint rod,

7. The copper defining bar is absolutely essential for obtaining the best head seam welds in the easiest and most reliable manner.

8. Pre-heating all seams by means of a long carbon arc prevents excessive chilling of the weld metal and the formation of hard, brittle constituents.

9. Post-heating all seams by means of a long arc tends to relieve welding stresses.

10. Interrupting the base seams at the middle of the joint increases materially the fatigue life of the fish-plates.

11. Staggering and tapering seams toward the ends of fish-plates is effective in producing a fillet effect at the ends of the joint.

12. Staggering the fish-plates likewise is effective in producing a fillet effect.

13. The order of welding seams should be such that the welded joint after cooling is slightly high rather than flat or concave. In general, the welded joint after cooling tends to be concave toward that side, or top, or bottom, on which the seams were welded first.

14. Immediately after welding, the joint should be carefully ground to the contour of the running surface of the rail.

## New England Club Activities

THE May meeting of the New England Street Railway Club will be held at the Copley-Plaza Hotel, Boston, Mass., May 22. There will be a session on "Safety" at 3:30 p.m. at which talks will be given by Lewis E. MacBrayne, general manager Massachusetts Safety Council, and H. K. Bennett, in charge of safety work, United Electric Railway of Providence.

Following the regular monthly dinner at 6:30 p.m., two papers will be presented. The subject of the first is "Claims," by J. J. Reynolds, Boston Elevated Railway, and the second, "Problem of Traffic Regulations as Affecting Street Railways," by H. F. Fritch, assistant general manager Eastern Massachusetts Street Railway.

The club's annual outing will be held at Norumbega Park, July 24.

## A.E.S.C. Track Bolt Committee

TENTATIVE designs for standard track bolts were considered by subcommittee No. 4, of the sectional committee on standardization of bolt, nut and rivet proportions, organized under the procedure of the American Engineering Standards Committee, at a meeting in the United Engineering Societies' Building, New York, May 14. Members or alternates present were C. W. Squier, chairman, New York; Lem. Adams, Omaha, Neb.; B. G. Braine, C. B. Bronson, New York; W. C. Cushing, Philadelphia, Pa.; J. H. Edmonds, Lebanon, Pa.; John B. Emerson, Chicago, Ill.; J. J. McLoughlin, North Tonawanda, N. Y.; E. F. Schermerhorn, New York.

It was decided that the tentative standards for track bolts should include both oval and elliptic necks, but that standards for the small sizes ⅜ in. to ⅝ in. inclusive, should be prepared with oval necks only. Tentative dimensions for all parts of the bolts, with the exception of maximum dimension for the necks, were decided upon. Mr. Braine, of the Rail Joint Company, who has a large amount of information in regard to the sizes of holes used in angle-bars, is to make a study to determine the average size of holes most generally used and make recommendations for neck dimensions of track bolts, which would be most universally used with these plates.

It was decided to specify the length of the threaded portion of standard track bolts. For the present elliptical head bolts are not to be considered for standardization, and the subject of nuts for track bolts is to follow recommendations of the American Railway Engineering Association rail committee.

## Trackless Vehicle Operation

THE statistical work being done by the committee on trackless vehicle operation of the Transportation and Traffic Association was reviewed at a meeting held May 12 in New York City. Among the subjects discussed were the tendencies in operating and maintenance methods, financial data, and a proposed set of rules and regulations for operating personnel. Present were W. J. Flickinger, chairman; B. W. Arnold, H. F. Fritch, J. B. Stewart, Jr., and V. E. Keenan.

# Possibilities of Railway Electrification Discussed

ELECTRIC power is an improved tool for the use of the railroads, was the conclusion of F. E. Wynne, manager railway equipment engineering department, Westinghouse Electric & Manufacturing Company, in an address before the Railway Club of Pittsburgh on April 24.

Since the power supply is practically 100 per cent continuous, the motive power alone determines the electric system's readiness to serve, he said. Steam locomotives are available for service from 25 to 50 per cent of the time, while electric locomotives in general have 75 per cent up to 90 per cent availability. Steam locomotives average about 55 miles daily, while if electric locomotives, exclusive of switchers, average less than 80 miles per day it is because of some peculiarity of the service.

The following figures were given as to the daily mileage of electric engines on several railroads:

| Railroad | Maximum Length of Runs | Average Daily Mileage |
|---|---|---|
| Chicago, Milwaukee & St. Paul | 200–440 | 136 |
| New York, New Haven & Hartford | 73 | 135 |
| Pennsylvania (New York terminal) | 12 | 120 |

The use of electric motive power makes it possible greatly to increase the capacity of tracks. Electric locomotives can handle safely larger trains at higher speed and at closer intervals. Multiple-unit trains have more rapid acceleration, faster schedules, power proportioned to the size of train, and the great reduction in engine and train movements at terminals.

The usual method of comparing locomotive maintenance costs directly on the basis of locomotive-miles was criticised by Mr. Wynne. Logically the maintenance costs should be compared on the basis of the work done. When so compared, he said, electric locomotives show a large reduction in the expenditures for inspection, enginehouse expense, repairs and replacements.

A number of advantages of electric operation were cited. Among them are the ability to hold trains on down grades by regenerative braking; elimination of smoke, gases and sparks; higher acceleration rates, and smaller number of locomotives required to perform a given service.

Electrification, further, opens up the field of improving operating methods on the railroads, which, in the opinion of the speaker, have not been embraced fully. More extended electrification will enable the railroads to realize and adopt improved operating methods contingent upon reduced delays, less wear and tear on equipment, less damage to goods and the elimination of intermediate engine terminals.

The ability to control almost unlimited electric motive power from one point, greater speed, reduction in delays and the greater reliability of electric power, afford means of greatly reducing engine crew and train crew expense.

The reasons for electrifying have been various, but in every instance successful operation has resulted. In many instances material benefits have accrued which, at the time of installation, were unexpected by either the railroad or the proponents of electrification. Some of these cases were cited.

Beyond question electric motive power is not only capable of handling all classes of railroad service, but it can do this better than is possible with steam, said Mr. Wynne. Motive power units, ranging in continuous capacity from 400 to 4,000 hp., are in operation, and locomotives now building will develop continuously 5,950 hp. at 28 m.p.h. These locomotives will be able to exert 300,000 lb. tractive effort, or seven times the maximum permitted on the heaviest railroad equipment in Europe. It therefore appears that there are now available electric locomotives far more powerful than required or usable by the railroads generally. In other words, electricity can adequately meet the physical requirements of transportation far beyond the present general demand.

Full advantage is not taken of the possibilities of electric operation unless it is used to develop new traffic, as well as to handle the going business at the time of installation. The ease and effectiveness with which passenger service can be improved by applying multiple-unit trains is worthy of careful study. In particular, suburban service can be induced thereby to produce worth-while increases in revenue. An instance is on record where electric service increased travel 100 per cent in the first year and attracted an additional 80 per cent the second year.

## Midwest Association to Meet

THE Midwest Electric Railway Association will hold its annual two-day meeting at the Fontenelle Hotel, Omaha, Neb., June 11-12. This was the plan decided upon at a meeting of the executive committee in St. Joseph, Mo., on May 9, and announced by President D. L. Fennell of Kansas City, Mo.

# American Association News

## Executive Committee

THE fact that a number of the members of the executive committee of the American Electric Railway Association expected to be in Cleveland last week for the Chamber of Commerce meeting suggested the selection of that city for the May meeting of the committee. President Budd was not able to be present so Vice-President J. N. Shannahan presided. Other members in attendance were: F. R. Coates, R. P. Stevens, J. P. Barnes, Harry Reid, E. F. Wickwire, C. E. Morgan, Charles L. Henry, J. J. Stanley, E. P. Waller for J. G. Barry, H. D. Shute, L. H. Palmer for C. D. Emmons, and J. W. Welsh.

The committee on publicity, through Mr. Wickwire, said that advantage had been taken of the thirty-sixth anniversary of the birthday of the electric railway, this last week, to broadcast some historical accounts of this event from a number of stations. These generally were given by men connected with the local systems and the accounts were localized. Considerable newspaper material was also sent out in connection with the anniversary. In all of this work the state committees on information were a great help. The "Traction Tom" series is being continued and subjects to be taken up shortly are jitneys, paving, and the attractiveness of the electric railway business for young men. Some companies have substituted portraits of employees for "Traction Tom." The committee has several posters on the way discussing means of relieving traffic congestion.

R. P. Stevens, reporting for the committee on company membership, said that four railway companies and one new manufacturer company have joined the association in the last month. The new members whose applications were approved are the Toledo, Fostoria & Findlay Railway, Fostoria, Ohio; Richmond-Ashland Railway, Petersburg, Va.; Beaver Valley Traction Company, New Brighton, Pa.; Mason City & Clear Lake Railroad, Mason City, Iowa; and the Brown-Lipe Gear Company, Syracuse, N. Y.

C. E. Morgan, reporting for the section and individual membership committee, said that there were four applications for affiliation with the Engineering Association. There were also twenty-two more applications, but these were not accepted because they were not properly filled out.

Mr. Welsh read an invitation from the Secretary of Commerce to Mr. Budd, asking him to appoint representatives on a national committee on street and highway safety. L. H. Palmer, reporting for the committee on mail pay, said that no decision had been handed down since the committee had submitted its brief.

The meeting concluded by the reading by Edwin J. Murphy, statistician of the association, of a further analysis of figures recently compiled by him of electric railway earnings for 1923, published in the issue of ELECTRIC RAILWAY JOURNAL of May 3 and in *Aera.*

## Nominating Committee

AT THE meeting of the executive committee in Cleveland on May 7, President Budd announced the appointment of a committee of seven to make nominations for officers of the association to serve during the year 1924-1925. The members of the committee appointed are: C. D. Emmons, Baltimore, chairman; P. H. Gadsen, Philadelphia; C. V. Wood, Springfield, Mass.; J. W. Hancock, Roanoke, Va.; E. C. Faber, New York; Myles B. Lambert, Pittsburgh, and L. J. Drake, New York.

## Exhibit Committee Starts Selling Space

By FRED C. J. DELL

Director of Exhibits, American Electric Railway Association

THE complete personnel of the exhibit committee for the American Electric Railway Association Annual Convention at Atlantic City, Oct. 6 to 10, is announced with this item. Under the direction of Chairman McQuiston, the important work of negotiating contracts has already been done, and the committee now is starting its drive to sell exhibit space for another big convention.

The diagram of the exhibit space on Young's Million Dollar Pier, application blanks for space and other printed matter are now being prepared and will be ready to go into the mail to the membership on June 2. This will be sent by registered mail to the representative of each manufacturer designated to receive all association correspondence. It will be incumbent upon these representatives to see that this matter gets into the hands of the official in the company who has authority to arrange for exhibition space.

A date limit will be set for the return of space applications, June 30, and all that are received up to and including June 30 will receive equal consideration from the exhibit committee, which will meet early in July to make the official assignment.

If you have not already done so, now is the time to begin to plan your display. Reports indicate that there will be an exceptionally large exhibit again this year, as considerable interest has been manifested by the manufacturers ever since the announcement of the convention location. So, plan now to be in Atlantic City next October for what will, without doubt, be the largest and best convention the association has ever had.

The personnel of the exhibit committee follows: Chairman, J. C. McQuiston, manager department of publicity Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.; vice-chairman, C. E. Morgan, vice-president and general manager Brooklyn City Railroad Company, 168 Montague Street, Brooklyn; James W. Welsh, executive secretary American Electric Railway Association; Fred C. J. Dell, director of exhibits American Electric Railway Association, 8 West Fortieth Street, New York; Joseph H. Alexander, Cleveland; Edward J. Blair, Chicago; C. P. Billings, Pittsburgh; Edward Dana, Boston; B. W. Frauenthal, St. Louis; George Keegan, New York; A. J. Purinton, Atlantic City; F. H. Gale, Schenectady; L. E. Gould, Chicago; Cornell S. Hawley, Albany; E. B. Meissner, St. Louis; A. L. Price, Mansfield, Ohio; A. M. Robinson, Philadelphia, and L. W. Shugg, Schenectady.

# The News of the Industry

## Peace in Pittsburgh

### Strike Terminated When Trainmen Accept Present Wage Scale for Two Years

The strike of the 3,200 motormen and conductors of the Pittsburgh Railways, Pittsburgh, Pa., in effect since May 9, was terminated on May 12 when the men decided to return to work at the present wage scale for two years. The men had sought a maximum increase of 10 cents an hour. The men voted 1,071 to 961 in favor of accepting the proposition submitted. The ballot carried the following proposition: "In consideration of an agreement arrived at by your wage committee and executive board with officials of the company in the Mayor's office, which is as follows: No cars to be operated by strike breakers pending result of mass meeting; all strike breakers to leave company property prior to operation of cars by our men. In consideration of the above, do you accept?"

The vote was yes or no. The proposition had been explained to the men during the meeting held prior to the voting.

According to the terms of settlement as explained by John L. Nelson, business agent of the local division of the Amalgamated, the following concessions were made by the company:

> The railway agreed to pay one-half the cost of one uniform over the two years of the new contract. Such uniforms must be purchased before Jan. 1, 1925. There is no stipulation as to where they shall be bought. The approximate cost of a uniform is $28.50.
>
> The company agreed to a better and different form of pass ticket for employees.
>
> Other favorable minor working conditions determined in conferences between the company officials and the wage committee and executive board.

The decision on the vote as to whether the strike should be called off and the determination of the proposal to be presented to the men for their vote was reached shortly before 3 a.m. on May 12 at a conference at which were present Mayor Magee, labor mediators, representatives of the car company and representatives of the men. The vote was taken following the enlisting of 2,200 auxiliary workers from out of town who were escorted to carhouses under police guard on May 10. Safety work had been rushed with the Council appropriating $25,000 for police equipment and with the ordering of automobiles and riot guns for emergency. Meanwhile the company in its advertisements sought the help of the patrons in the early solution of the situation and requested their indulgence during the interval of interrupted car service while plans were being made to restore operations.

Following the announcement of the vote for a settlement on May 12, the Mayor issued this statement:

> The final suggestion for a settlement of the strike, that the present wage agreement be continued for two years, came at the end of a five-hour session early this morning from the side of the carmen. I favor it as a practical conclusion of a most difficult and dangerous situation. If there was ever a time when the Pittsburgh Railways needs peace, it is now. For more than fifteen years it was in trouble with the public. For six years it had trouble with its creditors. It was discharged from the receivership only by obtaining a ten-year extension of payment of approximately $5,000,000 of obligations. Its financial credit is nil. A protracted strike would have been disastrous to the public. Another receivership might have resulted in a disintegration of the plant into a dozen separate units of operation. The settlement on the basis outlined will give the railway two years of repose, a period of time in which, with careful management and the co-operation of its employees, the credit of the company may improve, the good will of the public be cultivated, the riding habit of its patrons fostered and increased and the operation of the system be reorganized so that it will become an efficient public servant.

Conferences between the railway representatives and the men have been taking place since early in April, after the men had presented demands for a 70, 75 and 77 cent scale with a two-year agreement. The present rates of pay are 60, 65 and 67 cents an hour. This agreement expired on April 30. Following the presentation of the demands President Thompson announced in a letter to President Winters of the City Council that these demands of the men could not be met without creating a deficit in the revenues of the company. Then followed conferences, threatened walkout, still another conference and then a strike seemed inevitable. The latter was averted on May 1 by the last hour efforts of Mayor Magee, who sought deferment in order to have further parleys. But when the conference on May 8 ended in a deadlock the men took a second strike vote and ran their cars into the carhouse on May 9 at midnight.

## New York State Men Accept Present Wage Scale

Employees of the New York State Railways in Rochester, Syracuse and Utica by joint vote of 647 to 457 on May 12 accepted the proposition for a new contract embracing the present wage scale and with modified working clauses, as submitted by James F. Hamilton of Rochester, president of the company. Previously the union employees had rejected an offer embracing a 2 cent-an-hour wage cut.

Under the new agreement, which becomes effective at once, the men receive 51 cents an hour for the first three months, 53 cents for the next nine months and 55 cents for all service thereafter. Changes in working conditions include a basic day of nine and one-half hours instead of nine hours, a weekly guarantee of forty-two hours for new men, 75 cents maximum for overtime for men in the employ of the company more than one year and 71 cents for those working less than year. Operators for one-man cars will receive 80 cents an hour for overtime.

The trolleymen of Utica ratified the pact 148 to 81 and the Syracuse men by 281 to 17. Rochester voted down the agreement by 359 to 218. The workers of the three cities, however, are bound by the joint vote.

The Amalgamated gains a closed shop agreement, also with the right to organize operators of buses and trackless trolleys. The utility operates buses in the three cities and a trackless trolley line in Rochester.

## Court Will Decide Whether Detroit Must Arbitrate Wages

A crisis was averted on May 12 in the controversy between the Detroit Street Railway Commission and the local railway union, which demanded arbitration of the request for a 14 per cent wage increase.

Upon petition from officials of Division 26 and thirteen barn representatives of the union among the men, Circuit Judge Theodore J. Richter ordered the Street Railway Commission to show cause on May 19 why a writ of mandamus should not be issued compelling the commission to arbitrate with the platform men. Clarence E. Wilcox, claims attorney and counsel for the D. S. R., will represent the city and the Street Railway Commission at the hearing.

As matters now stand, the City Council has left the decision as to whether the Council shall be compelled to arbitrate to the Circuit Court, the petition asking the Council to order arbitration being turned over to the commission with a request for a report on it and no date set. The incident is considered closed as far as the Council is concerned.

The so-called agreement of Feb. 7, 1923, mentioned in the petition as having been violated by the commission, is according to the commission, not an agreement but simply a resolution spread on the books of the commission outlining the commission's attitude toward the men.

The commission, backed by acting Mayor Martin, has refused to consider the demands for increased wages and the subsequent demand for arbitration as made by the union on behalf of the platform employees. The city officials maintained that under the charter they were not permitted to deal with the union. The union stood firm in its demands fixing 10 a.m. on May 12 as the last hour for receipt of a reply from the commission on the demand for arbitration.

The commission and the acting mayor had stated that in event of a strike operators would be on hand to run the cars and that strikers would forfeit their seniority rights. Detroit merchants and manufacturers supported the commission by promising to grant leaves of absence to such employees as volunteered for service as platform men on the city cars. It is estimated that more than 6,000 former street car men are employed in Detroit, including a number of former D. S. R. and D. U. R. employees. Advertisements were run in the local papers seeking new men.

As the commission publicly outlined the situation it has no authority or right to permit outsiders or non-employees to control its departmental business plans directly or indirectly, and the management of a self-supporting city department, such as the Department of Street Railways, must at all times act in a judicial capacity as to the amount of the gross income which should properly be returned to the public in improved facilities and comfort, or decreased fare rates. The fact was also emphasized that 48 per cent of the department's income is expended in payments to labor.

The department plans to have regularly elected representatives from each city line meet with the commission once a month, in the belief that all friction and irritation will be erased once the platform men can, by this contact, be made to consider themselves responsible for the management and success of the railway.

## Bus Routes Approved Between Leetsdale and Sewickley, Pa.

The Public Service Commission of Pennsylvania has approved the application of the Beaver Valley Traction Company, New Brighton, Pa., for the incorporation of the Beaver Valley Motor Coach Company. This company has been formed for the purpose of operating coaches or buses in the counties of Beaver and Allegheny, but more particularly between the boroughs of Rochester and Colona, and between Leetsdale and Sewickley. At the present time there is no transportation service between the last two mentioned boroughs. The line of the Beaver Valley Traction Company has its southern terminus at Leetsdale and the Pittsburgh Railways has its northern terminus at Sewickley. The intervening gap of 2½ miles will be bridged by the proposed bus line. This will therefore not only give local service in the communities served but also will permit passengers to make through journeys from points on the Beaver Valley lines, particularly Ambridge and Leetsdale, to Pittsburgh, by way of the bus line and the Pittsburgh Railways. Other applications for bus routes to be operated by the Beaver Valley Traction Company are at present before the commission.

**Will Start Bus Line.**—The Eastern Wisconsin Electric Company, Madison, Wis., will start a bus line from Madison to Sheboygan, Wis. The route will be by way of Fond du Lac, Wis., where a change of buses will be made. The distance covered is 115 miles.

## Wage Agreements in East St. Louis

W. H. Sawyer, president of the East St. Louis & Suburban Railway, East St. Louis, Ill., and subsidiary lines announced April 30 that the company had reached an amicable agreement with its carmen, members of the Amalgamated, on a new wage scale effective May 1. The new contract runs for one year.

Men in the employ of the company on May 1, 1924, on the city lines of the East St. Louis Railway and the East St. Louis & Suburban Railway will receive the following pay in cents per hour:

| | |
|---|---|
| First three months | 47½ |
| Next nine months | 50½ |
| Next six months | 55½ |
| Next three months | 56½ |
| Thereafter | 57 |

New men employed after May 1, 1924, will receive in cents per hour:

| | |
|---|---|
| First six months | 45 |
| Second six months | 50½ |
| Thereafter | Above rates to apply |

One-man car operators, except in Belleville, 5 cents per hour additional.

The previous scale was: First three months, 45; next nine months, 48; next six months, 53; thereafter, 54.

On the interurban lines of the East St. Louis & Suburban Railway and the Alton, Granite & St. Louis Traction Company men in the employ of the company on May 1, 1924, will receive in cents per hour the following scale:

| | |
|---|---|
| First three months | 52½ |
| Next nine months | 55½ |
| Next six months | 57 |
| Next three months | 58½ |
| Thereafter | 59 |

Men employed after May 1, 1924, will receive:

| | |
|---|---|
| First six months | 50 |
| Next six months | 55½ |
| Thereafter | Above scale to apply |

Operators of limited trains 1 cent per hour additional.

One-man car operators on Brooklyn Division, 3 cents per hour additional.

One-man car operators on other divisions, 5 cents per hour additional.

The previous scale in cents per hour was: First three months, 50; next nine months, 53; next six months, 55; thereafter, 56.

On the Alton city lines of the Alton, Granite & St. Louis Traction Company men in the employ of the company on May 1, 1924, will receive the following wages:

| | |
|---|---|
| First three months | 47½ |
| Next nine months | 50½ |
| Next six months | 52½ |
| Next three months | 54½ |
| Thereafter | 55 |

Men employed after May 1, 1924, will receive:

| | |
|---|---|
| First six months | 45 |
| Next six months | 50½ |
| Thereafter | Above scale to apply |

One-man car operators 4 cents per hour additional.

The previous scale was: First three months, 45; next nine months, 48; thereafter, 52.

## Commanding Mountains in Oregon

The benefits of natural resources in mechanical output are emphasized in "The Might of the Mountains," issued by the Portland Electric Power Company, Portland, Ore., describing its Oak Grove hydro-electric development. This is the largest individual industrial enterprise now under construction in the Pacific Northwest, "representing $20,000,000 of faith and confidence in Oregon's future." Besides some attractive views of mountains and lakes, dams and power houses, the pamphlet gives some instructive information on the customer ownership of the company, with many "Pepco" highlights.

## Purchase Price the Big Question in Chicago

With the question of an operating board virtually settled, conferences between city officials and officials of the Chicago Surface Lines and the Chicago Rapid Transit Company looking toward the municipalization of the lines in Chicago are being held at least once a week.

Progress has been made with respect to the operation, with the adoption of the theory that if men of the right caliber are chosen for the "neutral" board, the lines will be operated in the best way possible, but there is virtually no change in the deadlock in the conferees with respect to the price.

The city regards the ordinance price as too high, and various items of the capital account have been under scrutiny. The lines have offered to agree to sell at reproduction prices estimated by competent evaluators, but this proposition has likewise been rejected by the city. Further conferences will be held.

## Committee Declares Grade Crossings Will Be Abolished

The utility committee of the Los Angeles City Council in reviewing recent petitions of the Union Pacific System and Santa Fé Lines to cross Anaheim Road in the Los Angeles harbor district at grade has strongly opposed the granting of the permit. This was made the matter of a hearing before the California State Railroad Commission at Los Angeles on May 8. The utility committee declared that traffic had been blocked for hours at the present heavily traveled highway, which is one of the main roadways to the Harbor District, and that automobiles were often lined up for miles waiting for a chance to pass over the crossing.

The committee further declared that no further permits would be granted to railroads to cross highways at grade within the city limits of Los Angeles and that all existing crossings at grade will be ordered abolished.

It is evident that the grade crossing problem in California has reached a most serious stage, according to the report of Lester S. Ready, chief engineer of the California State Railroad Commission. He recently discussed the issue in a paper before the National Conference on grade crossings, held in Chicago.

Mr. Ready's recommendations for lessening hazardous conditions at grade crossings involved the separation of grades, installation of wigwags, removal of all obstructions to the view, public control of lands adjacent to crossings, use of red lights as stop signal and elimination of advertising signs as semaphore warnings.

## Drastic Parking Measure Proposed at Chicago

A drastic parking ordinance is under consideration by Alderman Frank J. Tomczak, chairman of the safety commission appointed by Mayor Dever of Chicago.

The proposed ordinance is now being scrutinized by the corporation counsel's office as to its legality. It is so drawn as to prohibit the parking of automobiles on all streets on which there are street-car tracks. The author of the ordinance feels that such an ordinance would do more to lessen congestion than any other it is possible to pass. He says there would be a freer movement of traffic and the danger of accidents would be much decreased.

Opposition to the proposed ordinance has been voiced by officials of the Illinois Automobile Club and the Chicago Automobile Trade Association, who contend that if the measure passed and were enforced, motorists would find their machines practically useless for business purposes.

Others opposed to the measure pointed out that streets upon which there are now car-lines are practically free from parking, and that one street, notably Monroe Street, without a car-line west of a short distance from the loop, is one of the most congested streets, due to the parking which leaves a narrow lane for traffic.

"It is a safety measure," said Alderman Tomczak, when he heard of the complaints. "It is going to inconvenience the motorist, perhaps, but it will help the thousands of street-car riders and keep the streets safer for the children, and I'm going through with it."

## $2,000,000 Sought for Re-establishing Toronto Radials

Before the Toronto Board of Control Sir Adam Beck recently sought authorization for a bond issue of $2,000,000 to transform the York radial system into a paying proposition. The money will also provide for the complete rehabilitation of the system. His request has been referred to the City Treasurer and city engineers, who will report shortly on the matter. The amount of money which will be spent according to carefully prepared plans of the hydro engineers will, in Mr. Beck's opinion, entirely do away with the deficits of past operation and make the Toronto and York radials dividend-paying investments. He recommends that the amount to be spent be divided as follows: Mimico division, $750,000; Scarboro division, $150,000; Metropolitan division, $1,100,000. Total improvements for the system proposed amount to $2,076,272. There remains, however, from the previous appropriation of $600,000 some $82,241, leaving the total net requirement for the new program $1,994,030.

The Hydro Commission took over active management of these radials for the city of Toronto in November, 1922. Since then deficits have been shown by two divisions of the radial systems, the Metropolitan and the Scarboro. On the Mimico division there was a net surplus of $16,276. The deficit for the three lines for the period of operation is $205,649.

It is proposed to double-track the Mimico division, operate excursion trains of five or six cars on the Metropolitan division, operate regular two or three-car trains at certain hours, scrap old equipment and operate one-man, two-man cars on the Mimico and Scarboro divisions. On the Scarboro and Mimico divisions changes in both way and equipment will be made in order to insure more efficient operation.

Under the new plan $25,000 has been appropriated for a new freight terminal, $4,000 for a freight shed downtown and $10,000 for trucks to handle express and package freight to the city ends of the radial.

## Stops Eliminated in Cleveland

In an effort to speed up and improve service in Cleveland, the Cleveland Railway has eliminated 349 car stops with the sanction and approval of City Council and of City Street Railway Commissioner C. M. Ballou. The reduction in the number of stops represents a cut of more than 20 per cent. The stops in the residential part of the city are about 750 ft. apart, while in the downtown or congested district they average about 350 ft. apart.

Ralph W. Emerson, general manager of the Cleveland Railway, said:

> The elimination of the 349 stops has meant an average saving in running time of between ten and twenty minutes during the rush hours. It is enabling us to operate on schedule during rush hours, something we have never before been able to do, and it is rapidly making it unnecessary for us to send out so-called meeting crews to pick up cars that were running from ten to twenty minutes late during the rush hours.

The schedule speed in Cleveland today is almost 10½ m.p.h.

Mr. Ballou also points out that the stop elimination may help to reduce the amount of money paid out by the company for injuries and damages. In 1923 $1,125,000 was paid out on this account.

Mr. Ballou is now working out traffic code changes that will probably include an order banning automobile parking during rush hours on streets with car tracks. He may also suggest heavy penalties for drivers of motor vehicles who unnecessarily invade car tracks.

Councilman John M. Sulzmann is also planning to have an ordinance passed by the City Council making all streets on which there are tracks right-of-way thoroughfares, so that motor vehicles when crossing these streets will have to come to a dead stop before making the crossing.

The Cleveland *Plain Dealer* says that the policy of reducing the number of car stops is a step in the direction of improvement of a public service. That paper has pointed out to its readers that the street car patron who is compelled, by the elimination of a stop, to walk an additional block is the direct beneficiary of other stops which are eliminated. The *Plain-Dealer* said:

> In fact, the entire public is benefited. To speed up service, to give Clevelanders something approaching rapid transit, to take a step toward the transportation efficiency maintained by other large cities is the aim of those who have decreased the number of car stops. The benefit is real; the inconvenience is largely imaginary.

## Five-Cent Fare Wanted in Boston Tunnel and Subway

A movement has been started among the patrons of the Boston Elevated Railway, Boston, Mass., to secure a 5-cent fare for short rides in the tunnel and subway system. The East Boston people, who have just secured an improved service by the enlargement of the terminal facilities of the East Boston Tunnel and the introduction of a train service instead of the old surface car service, have petitioned the Elevated management for a 5-cent ride through the tunnel to Devonshire Street in Boston proper. This is a new principle in fare adjustments in Boston, as no part of the subway or tunnel system can be used today on a reduced fare basis. The Elevated has responded generously to the requests for reduced fares on short hauls throughout the city and its suburbs, so that a very large percentage of its traffic today is hauled on the 5-cent basis. There are numberless 5-cent zones in the district, but they are all on the surface.

James F. Jackson, chairman of the board of trustees of the Boston Elevated, says that his board may be willing to give the East Boston people a 5-cent fare between certain points in East Boston, and will not take very long to decide that question, but he does not promise to give favorable consideration at the present time to the introduction of the 5-cent rate in the tunnel. It could not, in any event, be granted until the end of the fiscal year, when it will be definitely known if the company will be able to make its yearly payment on its debt to the communities which helped the company financially in 1919 to meet its deficit.

## Suit Started Against New Orleans Property Owners

The city of New Orleans, La., through its special counsel in the matter, James Wilkinson, has started its first expropriation suit against property holders whose holdings in the area of the Rampart Street-St. Claude Street cut-off must be acquired by the city to make that street an artery for heavy traffic and give it the needed width to enable the New Orleans Public Service, Inc., to lay a double system of tracks along its route from Canal Street to the lower sections of the city.

This is in keeping with another of the recommendations contained in the Beeler report. Following the announcement that the city and the New Orleans Public Service, Inc., had $400,000 with which to acquire the needed property, owners of residences in that section of the city asked from 400 to 500 per cent profit over the cost price of the property.

In his suit it will be the aim of Mr. Wilkinson to stress the principle laid down by the Supreme Court in an opinion in which it held that in suits by governmental agencies to expropriate land for public purposes the assessments of the property for taxes was admissible to prove value, and further, that the Louisiana Constitution of 1921 provides that assessed value should be made the basis of payment in all levee board cases where property was taken.

## North Shore Says It Has Elevated Rights

Officials of the Chicago, Milwaukee & North Shore Railway have offered to pay the sum of $5,350 in additional revenue for the privilege of using the right-of-way of the Northwestern Elevated Railway into Chicago. They continue, however, to deny the contention of the city that the company is operating cars illegally over the elevated and without a franchise. Members of the Council committee on transportation have not approved the offer, but instead the entire question has again been referred to the corporation counsel's office.

Patrick J. Lucey, attorney for the company, contends that the line is an intrastate road over which the City Council has no control. The offer to pay additional compensation to the Northwestern road was made with the understanding that this road would then make additional payment to the city because of the extra revenue, in accordance with the present agreement.

An ordinance providing for the payment by the Northwestern of additional compensation to the city for the privilege of allowing the North Shore trains to run over its tracks will probably be the outcome of the controversy.

The city is apparently satisfied that the operation of the North Shore trains in no way slows or hinders the regular service on the elevated road. On the floor of the City Council aldermen have pointed out that the city would gain nothing by stopping the trains, but would seriously interfere with the passengers' wishes. Negotiations between Corporation Counsel Francis X. Busch and representatives of the North Shore lines are proceeding.

## Vocational Education Going Strong on Boston "L"

Several hundred employees of the Boston Elevated Railway have been engaged in systematic study during the past fall, winter and spring. On May 8 certificates were awarded to 133 men who had completed courses conducted under the auspices of the Massachusetts Division of the University Extension. Of these certificates, 106 went to students in the course in public utility economics, conducted by L. R. Nash of Stone & Webster. The remaining certificates were awarded for courses in practical electricity and dynamo-electric machinery. With the certificates the company returned the tuition fees which the men had paid for the courses.

The certificates were presented at a dinner, given by the company, at the Hotel Somerset. Before the presentation the men were addressed by James F. Jackson, chairman board of trustees, Boston Elevated Railway; Payson Smith, commissioner of education Commonwealth of Massachusetts; President Lowell of Harvard University, and the instructors who conducted the courses. General Manager Edward Dana acted as toastmaster. He stated that fifty different positions were represented among the students, and that their average term of service was sixteen years and their average age forty-one years.

Besides the University Extension students, many have been enrolled in local schools and in correspondence schools. Six are taking a co-operative course of college grade in the Massachusetts Institute of Technology, alternate terms being spent in school and on the railway property.

## One-Man Cars Allowed in Dubuque

One-man car operation, on trial in Dubuque, Iowa, for the past year, was officially approved recently by the City Council, which took the first steps toward repealing the ordinance, adopted some years ago, which prohibits the operation of one-man cars. As a result of this action by the Council, one-man cars will shortly be operated on all lines of the Dubuque Electric Company in the city with the exception of the West Eighth Street line. Two men will be used on the Main Street line during rush hours only.

The repeal of the ordinance requiring that all street cars have a motorman and a conductor does not take away from the Council power to regulate the street cars, the city solicitor explained to the Council members. The franchise under which the Dubuque Electric Company operates its system gives the Council the authority at any time to regulate the type of street cars used.

T. T. Parker, general manager of the company, appeared before the Council and informed that body that the year's trial of one-man cars, authorized by the City Council, would expire soon. Mr. Parker then explained that 40 per cent of the equipment now being used is of the one-man type. Operation of the one-man car has proved very satisfactory to the company, Mr. Parker said, and he added that he believed it had proved satisfactory to the public. He then asked the Council that it repeal the two-man car ordinance so that the company might operate the one-man car on such lines and at such times as it deemed advisable.

## Weekly Pass in Salt Lake City

The Utah Light & Traction Company introduced the weekly pass in Salt Lake City on May 4 for a three months trial following authorization by the Public Utilities Commission of Utah.

The cost of the pass through the one-fare zone is $1.25. A two-fare zone pass sells for $1.75, and for three-fare zones it is $2.25. The passes will not replace the 6¼-cent ticket or the 7-cent cash fare.

The passes for each week may be used from 4 a.m. Sunday of that week to 1 a.m. Sunday of the following week. Passes for each week are on sale for three days, from Saturday of the preceding week to and including Monday of the week for which the pass is usable. The passes are sold by street car operators as well as at the company's uptown ticket office. A pass may be used by any member of the family or by any one to whom it may be loaned. It is only good, however, for the transportation of one person, and no transfers are issued on passes. In introducing the new form of transportation the company advertised it extensively.

## Railways in Illinois Seek Bus Permits

The Illinois Commerce Commission has taken under advisement the applications of the DeKalb-Sycamore & Interurban Traction Company and the Illinois Power & Light Company to discontinue railway service in four Illinois towns. The board is also considering the application of the Northern Illinois Public Service Company to run buses between DeKalb and Sycamore.

The Illinois Power & Light Company has asked for permission to substitute buses for cars between Galesburg and Knoxville, while the DeKalb-Sycamore Interurban Traction Company seeks to stop operating cars in and between DeKalb and Sycamore.

The commission has set June 3 as the date on which it will hear the petition of the Peoria Bus Transportation Company to operate between Peoria and Farmington. The Murphysboro & Southern Illinois Railroad has withdrawn an application for a permit to operate buses between Carbondale and Herrin. The Coal Belt Electric Railroad and the Missouri Pacific Railroad (steam) opposed this permit.

## Union Backs Company's Discipline on Fares

Indorsement on the system employed by the Chicago Surface Lines in disciplining its trainmen was contained in a statement made at a recent meeting of their union by their president, William Quinlan. A report of this meeting, as printed in the union's official organ, the *Union Leader*, is contained in the following statement:

> Conductors who attempt to beat the fare register or fare box must realize that they will not be retained in the service. It is not possible to get away with it. The checking system used by the company has been investigated by the organization, and there is no indication that discrimination or hasty judgment enters into the determination of an employee's conduct. The check of a number of inspectors is studied before any conclusion is reached. All conductors are checked, and the fact that thousands of them remain in the service, with clean records, is evidence that there is no desire on the part of the company to get rid of competent conductors.
>
> President Quinlan stated that, due to an understanding reached some time ago that men would be warned of infractions of the rules and given an opportunity to correct their mistakes before being discharged, the number of men leaving the service for these causes has been reduced about one-half. He urged executive board members and the older members on the lines, particularly those who break in students, to warn the younger members of the pitfalls; to urge upon them the necessity of living up to the rules as nearly as possible; to register fares promptly and correctly, and to use caution in averting accidents.

## Beaver Valley Men Continue at Last Year's Pay

Trainmen of the Beaver Valley Traction Company, New Brighton, Pa., are operating on the same wage scale which has prevailed for the past year. That schedule is 60 cents an hour maximum for operating two-man cars and 65 cents an hour for operating one-man cars. The men voted whether they would continue on their old scale with the understanding that the same differential in the rates as compared with Pittsburgh would be maintained. The vote was unanimous.

## News Notes

**Will Seek Old Rate.**—The experimental 5-cent fare of the Hornell Traction Company, Hornell, N. Y., is to be abandoned, it is reported, and the old 8-cent rate is to be restored as soon as the necessary permission can be obtained. Recently the owners of the road decided to abandon the property, but a reorganization was effected and in an effort to stimulate business the fares were dropped from 8 cents to 5 cents.

**Will Hear Bus Application.**—The United Traction Company, through its subsidiary, the Capitol Transportation Corporation, has applied to the city of Rensselaer, N. Y., to operate a bus line in that city. A public hearing has been set on the application for May 20, after which the Common Council will act on the application.

**Jitney Regulations Revised.**—Roanoke, Va., is to have a new deal with respect to the jitneys. The autos run for public hire in competition with the railway lines of the Roanoke Railway & Electric Company will not be entirely eliminated, but they will in the future be more closely regulated. They have been ruled off some streets entirely, and in the future only men who qualify as capable drivers will be licensed to run jitneys.

**May Run One-Man Cars.**—It is reported that the Danville Traction & Power Company, Danville, Va., is preparing to ask the City Council for permission to operate one-man cars on its line. The company a short time ago announced a 5-cent fare experiment for a period of ten days with the purpose of increasing its patronage. If unsuccessful, it was stated that the company would revert to the 7-cent fare.

**Will Operate Line.**—The Northampton Street Railway, Northampton, Mass., has voted to accept a proposal of the Northampton Chamber of Commerce to operate the line of the Connecticut Valley system between that city and Hatfield, recently discontinued. A guarantee fund has been pledged to meet expenses. It is understood that arrangements for the purchase of the line from D. P. Abercrombie, receiver for the Connecticut Valley, will soon be completed. A similar plan for operation of the line from Northampton to Amherst is deemed probable.

**Buses Up to Voters.**—The City Council of Duluth, Minn., by a 4 to 1 vote has decided to submit to the voters of the city on June 16 the initiative ordinance for the regulation of buses on the streets of the city. If the ordinance prevails at the special election, all buses, except taxis and those engaged in intercity or interstate traffic, will be barred from the use of all streets on which the Duluth Street Railway now maintains a double-track system. The Council received a petition, signed by a required number of voters, asking it either to pass such ordinance or submit it to the voters. The Council declined to act on the proposition and chose the alternative method of disposing of the matter. The Bus Owners' Association is already waging an active war against the passage of the ordinance, but supporters of the measure are confident that it can be passed.

**Extension Association Formed.**—An indication of the dependence which Chicago subdividers place upon the extension of transportation is apparent in the name of an association just formed, which is to be known as the Northwestern "L" Extension Development Association. The object of the association is to obtain co-operation in laying out the new town of Niles Center and working out plans for public improvements.

**Payroll Statement Incorrect.**—The combined payroll of the Springfield Street Railway and the Worcester Consolidated Street Railway is $4,005,750. In reviewing the wage hearings of these companies in the ELECTRIC RAILWAY JOURNAL, issue of May 3, it was stated that this figure was $1,832,789, which is the amount of the payroll of the Springfield company alone.

**Voters to Decide Trolley Issue.**—An election is to be held in Brunswick, Ga., at which the voters will decide the question of authorizing the City Commission to enter into a contract with the Brunswick & Interurban Railway for the leasing of the system with the option to the city of purchasing it. The line has been operating at a loss and was about to be junked.

**Offer Free Service.**—The Springfield City Council passed an order May 12 calling on the transportation board to take action to prevent further operation of jitney buses in competition with the Springfield Street Railway, Springfield, Mass. Since May 1 many of the buses formerly licensed to carry passengers have been running on the basis of offering free service. They are carrying many persons and it is said that virtually all the passengers leave coin to pay for the service they thus receive. How to stop this competition is the question before the municipal officials.

**New Agreement to Go Before Ratepayers.**—A revision of the proposed franchise between the city of St. Catharines, Ont., and the Niagara, St. Catharines & Toronto Railway has been accepted by the City Council of St. Catharines. The new agreement will be submitted to the ratepayers of the city next month.

**Resolution to Oppose Increase Suspended.**—The Aldermen of Providence, R. I., have adopted a resolution suspending a resolution passed by the City Council several weeks ago and signed by Mayor Gainer directing the City Solicitor to appear before the Public Utilities Commission and oppose any increase in fares asked by the United Electric Railways. The suspension will be in effect until all Providence zones are extended to the city line, "pending an investigation of the whole subject of increase in fares and extension of fare zones by the joint special committee on United Electric Railways affairs." Under the new schedule which has been filed by the United Electric Railways with the Public Utilities Commission four city zones are not extended to the city line.

**Charges Fares Are Unjust.**—The city of San Bernardino has filed a complaint with the California Railroad Commission against the Pacific Electric Railway alleging that the passenger fares in the city of San Bernardino are unjust and unreasonable. It is alleged that the fare from certain portions of the outlying district of San Bernardino to the business center is 9 cents, while from that territory to the business center of Colton it is but 6 cents, although the distance traveled for the 9-cent fare is less than the distance traveled for the 6-cent fare. The city asks the commission to order a 6-cent fare in effect from a point 2,640 ft. south of Mill Street to all points in the city of San Bernardino.

**Congestion Will Be Relieved.**—Under an order by the New York Public Service Commission, effective May 15, 1924, the Schenectady Railway is relieved from carrying local passengers in the city of Albany, the company being permitted to extend its eastern limits from Stop 32½ to Stop 33. Arrangements have been effected between the United Traction Company and the Schenectady Railway whereby all local passengers within the city of Albany will be transported by the United Traction Company. This, it is believed, will relieve congestion in the service between Albany and Schenectady and otherwise facilitate operation of traffic in the city of Albany.

**Company Denies Charges.**—The city of Oakland, having filed a complaint with the California Railroad Commission against the Key System Transit Company, alleging that its local railway service is inadequate and does not properly serve the needs of the city, the defendant corporation has filed its answer with the Railroad Commission. It enters a general denial to the city's allegations, asserting that it has officially signified its desire to co-operate in every way possible with the city of Oakland and that in furtherance of this desire the company has appointed Richard Sachse, a former chief engineer of the Railroad Commission, to make a survey and to report recommendations for the improvement of the service.

**Allows Operation Without Transfers.**—Among the measures vetoed by Governor Smith, in what is known as the omnibus message, thirty days after adjournment, was the Russell bill authorizing the Transit Commission to extend for a period of one year the operation of the railway line of the Nassau Electric Railroad in the Borough of Brooklyn, commonly known as the Park Avenue line, without exchanging transfers with connecting lines, notwithstanding the provisions of any charter, franchise, agreement or statute. The Clayton bill extends the same provision to the Church Avenue line. Lines of this company have been exempted from issuance of transfers by special legislative permission from year to year since 1921, and the vetoing of the two bills by the Governor means that when the order of the Transit Commission issued a year ago expires these two lines will then be obligated to issue such transfers as is provided for in their charter or franchise agreements.

# Foreign News

## Electrification in the Belgian Congo

The work of electrifying and extending the railway in the Belgian Congo has been undertaken by the Société des Constructions Africaines, a Belgian company. The contract is for 270 km. of single-track line, at a figure of 30,000,000 francs, the work to be completed within thirty-six months from October, 1923.

The necessity of this new trackage is made apparent by the blocking of various port terminals where there are continually 25,000 tons of merchandise from the interior piled up awaiting transport. It is expected that the new line will be able to move 500,000 tons per year. The entire electrification scheme involves the expenditure of 50,000,000 francs and with its completion an anticipated reduction of 6,000,000 francs per annum in operating expenses will be brought about. In addition it is stated by the government press that traffic conditions will enable practically unlimited tonnage to be transported in view of possible extensions and improvements which may be later required and met.

## Paris Suburban Electrification Opened

Electric surburban trains were run out of the St. Lazare Station of Paris for the first time the morning of April 27 under the plan for the electrification of the suburban lines. The trains were run to Bois Colombes, in which village is the stadium where the Olympic Games are to be held during the summer. The running time to the stadium is twenty minutes, and it is estimated the trains will be able to handle 50,000 persons daily.

The trains resemble the all-steel trains on the New York subway. They are labeled as being "absolutely fireproof."

A departure from the European system is to be made by the elimination of third-class passengers. Only passengers of the first and second class will be accommodated. There is to be no smoking on the trains.

## Rouen Tramways Profits

The Rouen Tramways Company, in the French city of Rouen, with 125,000 inhabitants, made a net profit of 1,224,088 francs during 1923. The gross receipts were 10,278,249 francs, practically an increase of 1,000,000 francs over the year before. This improvement is due to increased services rendered during the year, brought about by a notable increase in the traffic of the port of Rouen. The expenses of 8,067,678 francs represent an increase of 1,503,566 francs as compared with 1922, chiefly due to greater cost of imported coal.

The operating ratio which was in 1922 0.705 increased in 1923 to 0.785. The company operates under an agreement with the municipality whereby a part of the profits are turned into the city treasury. In 1923 the city's revenue therefrom amounted to 165,440 francs.

Track laying, repair costs and new equipment begun in 1922 were carried out in 1923 to the extent of 4,771,000 francs. A new loan of 10,000,000 francs was negotiated, due in 1964. Dividends on common stock were paid at 5 per cent.

## Tokio May Have Subway

The first subway in Japan will be built shortly in Tokio, although it is merely an experiment, with a length of 1½ miles, and it will not serve as a connection link between the residential sections and the city's business center, which the citizens want most keenly to have. However, it will be an object lesson both to capitalists and people. If it succeeds, it will prove the beginning of a big drive for subways, and capital will begin to flow in that channel. Traffic congestion on the electric tramways in Tokio, Osaka and other large towns in Japan was already serious before the quake of last year. Only a radical change in traffic control could relieve it, in the opinion of the public. The drift of public opinion encouraged promoters in the electric traction field, and in Tokio alone several subway companies were floated. Government charters were obtained and in some cases borings were made at many places in Tokio to study the geological formation to determine the method of tunneling.

Prior to the recent quake not a single mile of subway had been built, however, and the public grew suspicious of the subway promotions.

The present plan for subway construction in Tokio is by new men, although they will carry it out by taking over one of the pre-quake subway companies. In their opinion, with the new line actually built and its usefulness demonstrated, subway enterprises will regain their standing. Baron Furuichi, Privy Councillor, is the president of the subway company, and Shosuke Nakagawa, lately Vice-Minister of Railways, is vice-president.

The section to be built is under a broad thoroughfare connecting Uyeno Park with Asakusa Park, upon which at present runs a surface railway owned and managed by the Tokio Municipal Electricity Bureau. This section being the connection link between two main pleasure resorts of the city, the traffic on the surface road is exceedingly heavy.

This section was low marshy land before the capital city sprang up 300 years ago. Some geologists doubt if it is fit for an underground road, but the promoters insist that this doubt is not well founded, although it is admitted that at one or two places the formation is loose. According to the company's original plan the tubes, which are to be reinforced concrete, are to be laid 3 ft. under the surface of the road. They are to be 22 ft. wide and the height of the rectangular tubes must not exceed 12 ft. Construction will be by the cut-and-cover method in sections of 600 to 1,200 ft.

It is proposed to run steel cars, three to six in a train. Proposed headways are two to five minutes, and their average speed between 34 and 35 m.p.h.

## Ten Swedish Railways May Electrify

Following the electrification of the Swedish State Railroads between Stockholm and Gothenburg, now in progress, it is proposed to electrify at least ten of the privately-owned railroads. According to recent news dispatches, these are being studied by a special commission with a view to the adoption of electric operation.

These ten lines all run through central and southern Sweden in the most densely populated and most highly industrialized regions of the country.

**Planning Culoz-Modane Electrification.**—The French Minister of Public Works has reported the planning of the electrification of the Culoz-Modane Railway to make possible the electrification of the Paris-Lyons-Mediterranean Railway. The section which it is proposed to electrify is 125 km. in length. It is expected that the work will be completed by 1925.

**Tramway Proposed for Hankow.**—Chinese capitalists of standing, propose to raise $2,000,000 and form a company for the operation of tramway service in Hankow. The promoters will pledge one-half the capital and the other half will be raised from other sources. It is said that the development of the city, which is an important Chinese commercial port, is being hampered by the lack of transportation facilities. Local officials with authority to grant concessions have expressed themselves as favorably impressed with the scheme.

**Beirut Tramways to Increase Capital.**—The French company operating the tramways and light and power supply system in Beirut, Syria, announces that its capital will be increased from 200,000 francs to 10,000,000 francs and that the company will be fused with the former Société Ottomane des Tramways et d'Electricité de Beirut. The large increase in capitalization shows plainly the vast strides that French interests are making under the mandate granted France under the Versailles treaty. The company is largely controlled by Paris bankers and French contracting interests in Beirut.

**Decrease in London Tramway Traffic.**—During the financial year ended March 31 last the number of passengers carried by the London County Council Tramway was 689,015,086, a decrease of 44,796,281 as compared with the previous year. The aggregate receipts were £508,386. Owing largely to increasing bus competition the weekly tramway traffic receipts have shown reductions for a considerable time.

# Financial and Corporate

## Drastic Cut in Capital

### $51,202,823 Reduction in Outstanding Securities Arranged in Reorganization of New York Railways

A plan to reorganize the New York Railways, operating 75 miles of surface line in New York City, under preparation for several months, was approved on May 14 by Federal Judge Julius M. Mayer. It will become effective as soon as the terms receive the approval of the Transit Commission. The present capitalization of the company is approximately $91,366,000. On completion of the plan of reorganization the capitalization will not exceed $38,788,472, principal amount of bonds, and 184,830 shares of preferred stock without par value, and 90,200 shares of common stock without par value. The reduction in capitalization therefore is $51,202,823 and in annual charges $1,494,905. Fixed charges were $3,628,533 annually.

The capitalization of the new company is thus distributed:

| | Principal | Annual Interest |
|---|---|---|
| Bonds to remain undisturbed or privileged to conversion...... | $14,653,000 | $728,000 |
| Bonds to be extended | 600,000 | 34,500 |
| New Sixth Avenue purchase bonds.... | 300,000 | 15 000 |
| New prior lien bonds. | 3,800,000 | 190,000 |
| Tentative total of fixed charge bonds. | $19,353,000 | $967,500 |
| New income bonds... | 19,435,472 | 1,166,128 |
| New preferred stock, 184,830 shares (at $5) | 924,150 | ....... |
| New common stock, 90,200 shares (at $5) | 451,000 | ....... |
| Tentative total capitalization ....... | $40,163 622 | $2,133,628 |

That the new company may have sufficient capital the plan authorizes the issue of prior lien bonds not to exceed $5,000,000, these bonds to be a lien on the company's property and on all property acquired by use of the money obtained through their sale. Authority is also conferred upon the new company to create an issue of income bonds of a face value of $21,000,000, which shall be a lien junior to the prior lien bonds.

Preferred stock may also be issued of a par value to be determined later, with non-cumulative dividends payable at periods to be determined, but no dividends shall be paid on the common stock "unless and until in the same calendar year of such payment the full dividend of $7 per share shall have been paid or set aside for payment on the preferred stock." The preferred stock is limited to 184,830 shares.

The common stock may be of no par value or of such value as may be determined, and with a total issue of approximately 90,200 shares will have the sole voting power. It may be placed in a voting trust.

Judge Mayer pointed out that the plan provides for the continuance, under the control of the new company, of all the service at present operated under the receiver. The Ninth, Eighth and Fourth and the Madison Avenues lines, formerly under lease to the New York Railways were withdrawn since the present receivership because of defaults in rentals.

Judge Mayer expressed appreciation of the New York Transit Commission's co-operation in assisting the court to end transit receiverships and called attention to the fact that when this receivership is ended there will no longer be any active transit receiverships in the Federal courts of this jurisdiction. Judge Mayer said that when the receivership began in March, 1919, the property was in very bad condition and embarrassed by a seemingly insuperable load of debt and that, despite "numerous economies and the careful management under the receiver," it had been plain at all times that it was necessary substantially to reduce the outstanding capital.

It is expected that the new company, with a name to be chosen later, will be in sole control of the properties not later than July 1. In the meantime the receiver, Job E. Hedges, will continue to function.

## Proposition Received on St. Louis & Suburban Property

Bondholders of the St. Louis & Suburban Railroad, part of the United Railways, St. Louis, who have been seeking a separate receiver and valuation of their property, have received a definite proposition for its purchase. While the exact terms of the offer have not been revealed, it is said to approximate $6,000,000, or within $500,000 of the total par value of the bonds.

This situation has added to the difficulties of the reorganization committee of the United Railways, which in the latest reorganization plan proposed to retire $4,500,000 of the Suburban's general mortgage bonds and renewed the $2,000,000 Suburban consolidated bonds. Suburban bondholders have stated that they wanted their money in full or the property returned to them.

City Counselor Senti has applied to the Federal court for leave to intervene in the application of the St. Louis & Suburban bondholders for a separate receivership for that system. The city is interested in preserving the railway system as a unit and in protecting the existing transfer arrangement. Judge Faris, in replying, said that he recognized that the city had a sentimental interest in the case, but that he doubted its legal right to intervene. He said he would withhold his order until he had an opportunity to go into all of the legal phases of the case. He then referred the city's petition to Special Master Fred L. Williams.

J. K. Newman of Newman, Saunders & Company and a member of the reorganization committee of the United Railways has arrived in St. Louis to start the expert work which his company will do in connection with the lifting of the receivership. He has stated publicly that he favors a service-at-cost arrangement involving a fixed return upon invested capital and a varying rate of fare sufficient to provide a profit under varying conditions.

## Fifty-Mile Long Island Line Wants to Quit

Lincoln C. Andrews, the receiver of the New York & Queens County Railway, Long Island City, N. Y., filed a petition on May 9 asking the Supreme Court to permit him to cease operation of the lines of the company. The receiver was prompted to take this action because the city of New York plans to pave within the railway area during the coming summer and to charge the cost of the pavement against him. The Highway Department's estimate of this expense is $340,000. The estimated gross revenue of the company for the year 1924 is $650,000. The lien against the property resulting from a paving bill of this kind would wipe out the remaining equity of the bondholders. In order to prevent the paving charge from becoming a lien, the only resource left to the company is to abandon service and franchises prior to the beginning of the paving work.

The President of Queens has agreed to postpone the beginning of paving work for two weeks pending negotiations between the municipal authorities and the receiver. A notice has been posted in all cars in order to advise passengers of the company's side of the case. This notice is as follows:

> City paving charges and taxes will take 3 cents out of every car fare we can collect this year.
>
> That leaves us 2 cents on which to run the railroad. Impossible!
>
> That is why we have got to quit.

Justice Cropsey in Supreme Court, Queens, on May 15 granted an adjournment until May 28 of the argument on the motion for permission to abandon operation of the company's lines.

The railway operates about 50 miles of line from Long Island City to Woodside, Corona, Elmhurst, Flushing, College Point and Jamaica.

## Earnings of Interurban Improve

The recent earnings of the Lake Shore Electric Railway, Cleveland, show improvement. The territory served by the company, particularly that between Cleveland and Sandusky, is building up. There is very little bus competition. About 20 per cent of the gross revenue is from power sold. The figures for March, 1923, and 1924 and for the first three months of the last two years follow:

STATEMENT OF EARNINGS OF LAKE SHORE ELECTRIC RAILWAY

| | Month of March | | Jan. 1 to March 31 | |
|---|---|---|---|---|
| | 1924 | 1923 | 1924 | 1923 |
| Gross earnings..... | $255,054 | $242,310 | $735,854 | $657,360 |
| Expenses and taxes | 193,930 | 193,825 | 577,519 | 530,816 |
| Net ........ | 61,124 | 48,485 | 158,335 | 126,544 |
| Interest.... | 35,319 | 35,578 | 106,078 | 106,638 |
| Surplus.... | $25,805 | $12,907 | $52,257 | $19,906 |

## Good Report from Cuba

### Earnings of the Railway Division of the Havana Company Show Increase—Operates Buses

The report of the Havana Electric Railway, Light & Power Company, Havana, Cuba, for the year ended Dec. 31, 1923, shows a net profit carried to surplus account of $2,386,133. Last year the net profit was $2,235,881. In 1923 in the railway department there was a gain in gross earnings of 1.88 per cent and in net earnings of 3.37 per cent. This department contributed 43.6 per cent of the total gross earnings from operation and 29 per cent of the total net earnings.

The earnings showed only a small gain over 1922, all of which occurred during the last three months. The total operating expenses also rose slightly, but not due to any failure to continue the improved methods that effected such a notable saving in the preceding year. The increase was mostly due to the higher price of power plant fuel and damage to rolling stock caused by a heavy storm that flooded a considerable portion of the city. A considerable part of these expenses was balanced by new savings in maintenance of track, lines and equipment.

During the winter tourist season a motor bus service was operated between the Parque Central and the principal hotels in Havana and the Hotel Almendares and the Casino in Marianao. This was started by other persons in 1921, using five single-deck Renault thirty-two passenger buses, but they were not successful. In 1922 the Havana company bought the Renault buses and in addition built four double-deck buses of the Fifth Avenue, New York, type for thirty-four passengers, and since then they have been operating in half-hourly service in the tourist season while the Hotel Almendares is open, and on Saturdays and Sundays during other months, at 30 cents for the trip between Havana and the Hotel Almendares. In 1923 the gross earnings of the seven motor buses were $17,487 and the total operating expenses were $15,843.

## They Serve Civilization

The National City Company, New York, is a firm believer in the future growth of public utilities. The company has endeavored to show the intimate connection between the public utilities and every phase of city and country life in "Mighty Servants of Civilization," an instructive and attractively compiled booklet with illustrations of the various utilities in service. The investment angle is no small part of this enterprise and a great deal can be learned about the financing of public utility companies after a reading of this book, as well as the reasons for utilities being good investments.

STATISTICS OF RAILWAY SERVICE IN HAVANA

| | 1922 | 1923 | —Increase over 1922— | Per Cent |
|---|---|---|---|---|
| Total number of passengers carried | 113,011,816 | 114,292,880 | 1,281,064 | 1.13 |
| Passenger car-miles | 17,532,658 | 17,722,683 | 190,025 | 1.08 |
| Passenger earnings | $5,650,590 | $5,714,644 | $64,053 | 1.13 |
| Passenger earnings per car-mile | $0.3222 | $0.3224 | $0.0002 | 0.06 |
| Total earnings from operation | $5,756,438 | $5,864,904 | $108,465 | 1.88 |
| Total operating expenses | $3,689,592 | $3,728,344 | $38,752 | 1.05 |
| Total operating expenses per car-mile | $0.2104 | $0.2103 | $0.0001* | 0.05* |
| Operating ratio | 64.10% | 63.57% | | |
| Net earnings from operation | $2,066,845 | $2,136,559 | $69,713 | 3.37 |

Total earnings and operating expenses include motor buses.
* Decrease.

CONDENSED PROFIT AND LOSS ACCOUNT FOR THE YEAR ENDED DEC. 31, 1923

| | Railway Department | Light and Power Department | | Total |
|---|---|---|---|---|
| Gross earnings from operations | $5,864,904 | $7,593,159 | | $13,458,063 |
| Operating expenses | 3,728,344 | 2,355,390 | | 6,083,735 |
| | $2,136,559 | $5,237,769 | | $7,374,328 |
| Deduct: | | | | |
| Taxes, U. S. A | $60,531 | $171,500 | | $232,031 |
| Taxes, Cuba | 40,000 | 212,200 | | 252,200 |
| Trigo annuities | 3,373 | ........ | | 3,373 |
| Interest | 637,188 | 479,977 | | 1,117,166 |
| | $741,093 | $863,677 | | $1,604,771 |
| | $1,395,465 | $4,374,091 | | $5,769,557 |
| Deduct: | | | | |
| Reserve for depreciation | $607,175 | $1,903,193 | | $2,510,368 |
| Reserve for contingencies | 203,168 | 636,831 | | 840,000 |
| | $810,343 | $2,540,024 | | $3,350,368 |
| | $585,122 | $1,834,066 | | $2,419,188 |
| Add: | | | | |
| Interest on deposits | | | | $193,037 |
| Income from securities | | | | 18,282 |
| Rents | | | | 35,278 |
| Other miscellaneous income | | | | 149,672 |
| | | | | $396,270 |
| | | | | $2,815,458 |
| Deduct: | | | | |
| Miscellaneous accounts written off, net | | | $78,211 | |
| Amortization of discount and expenses on funded debt | | | 46,993 | |
| Provision for sinking fund of thirty-seven-year English 5 per cent mortgage bonds of Compañia de Gas y Electricidad de la Habana | | | 16,433 | |
| Provision for sinking fund of consolidated mortgage 5 per cent gold bonds of Havana Electric Railway Company | | | 137,861 | |
| Provision for sinking fund of general mortgage 5 per cent sinking fund gold bonds of Havana Electric Railway, Light & Power Company | | | 149,824 | 29,325 |
| Net profit for the year, carried to surplus account | | | ........ | $2,386,133 |

## Reorganization of Second Avenue Railroad, New York, Planned

Plans for a reorganization of the Second Avenue Railroad, New York City, operating 23 miles of line, will be presented by a committee within a few weeks, and, when ratified by the several groups of bondholders, will be submitted to the courts, with a view to terminating the receivership by next fall. It is understood that a reduction of outstanding equities will be required for the company's restoration. The total bonded debt is $8,860,000.

The receiver's report for the nine months ended March 31 shows that the Second Avenue is about the only surface railway in Manhattan that in this period reported financial improvement. Passenger revenues were $714,906, an increase of $62,262 over the similar period a year ago. Operating revenue was $798,790, an increase of $49,715, while operating expenses were $658,547, a decrease of $22,044.

The total gross income applicable to corporate and leased properties was $71,195, against a deficit of $633 in the preceding period, or an improvement of $71,828. After allowing for fixed charges of $158,996, practically all of which is in interest, there was a net corporate deficit of $87,801, compared to a deficit of $145,528 a year ago. No charge for depreciation is contained in the receiver's report.

The Second Avenue Railroad was incorporated in 1853, and its line leased in 1898 to the Metropolitan Street Railway at an annual rental of 8 per cent on the stock for the first three years and 9 per cent thereafter. In September, 1908, Supreme Court Justice Bischoff appointed a receiver of the company in a suit brought by the Guaranty Trust Company to foreclose the consolidated mortgage of $5,682,000, against which there had been issued a like amount of 5 per cent consolidated gold bonds, due Feb. 1, 1948.

## Tax Payment Problem in Seattle

The latest problem before the operators of the Seattle Municipal Railways, Seattle, Wash., is where the money is to be obtained to pay the city's share of the 1919 tax on the street railway, which the Supreme Court recently ruled must be paid jointly by the city and the Puget Sound Power & Light Company. The sum, with the heavy interest which has accumulated, now amounts to more than $650,000 for the city's share, which is three-fourths of the total. Two courses are said to be open, one to appropriate money from the street railway fund, which is in low financial state, and the other to obtain money from the general fund.

If money is drawn from the street railway revenue, Councilman E. L. Blaine, chairman of the city finance committee, says there is grave doubt that the department will go on a cash basis, as scheduled for May 10. He states that the department is on an excellent financial basis at this time, with complete recovery at hand from the $600,000 loss incurred when the 5-cent fare was adopted last spring, and should retire its bonded indebtedness rapidly, if the proposed invasion for tax payment is not made. During March $369,975 in interest and $833,000 on principal were paid on outstanding bonds. Another big interest payment is due in September, when $348,150 must be paid on four bond issues. The last installment paid on the principal reduced the amount of interest to the extent of $41,000.

Corporation Counsel T. J. L. Kennedy has been asked to render an opinion as to how the tax money may be secured.

## Elevated Sells Stock Direct

### $5,000,000 Prior Preferred Issue of Successor to Chicago Elevated Being Offered at Par

Prior preferred stock of the Chicago Rapid Transit Company is being offered locally in Chicago to the amount of $5,000,000 at par. The stock-selling campaign is in charge of a central executive committee. The securities are being offered to employees first for a period of three weeks starting at once. At the end of that time the stock will then be offered to the general public through the employees as salesmen.

The employee campaign is being handled by five division managers, each representing divisions of Chicago Rapid Transit Company, namely, the Oak Park, the South Side, the Northwestern, the Metropolitan and the Loop or Central Division. Each division manager has appointed five team captains, and each of these captains will in turn have ten employee salesmen. Rivalry between teams and divisions is being maintained by bulletins and posters. All sales reports are cleared through the central campaign office daily and thence go to the Utilities Securities Company, which will handle the records and the money received on partial payments and will issue stock certificates when payment has been made in full. Many Rapid Transit Company employees who have had previous experience in the sale of other Chicago utility securities will take part in the present campaign. The sale now being conducted is regarded as significant as it and the earlier Chicago, Milwaukee & North Shore campaign represent offering of railway securities direct to the public without any of the incentive to purchase which naturally adheres to offerings of companies which include both light and power properties.

The offering of prior preferred stock is part of the program of new financing under way for the Chicago Rapid Transit Company intended to provide funds for carrying out extensive physical improvements and for refunding maturing obligations. In this connection the Illinois Commerce Commission has authorized the issuance of $7,500,000 of first and refunding mortgage bonds to retire $8,000,000 of South Side Elevated bonds maturing July 1, 1924, and $5,000,000 of 7.8 per cent prior preferred stock with dividends payable monthly at the rate of 65 cents a share. Of the proceeds from the new stock $3,000,000 will be used to pay for the work of increasing platform lengths to accommodate eight-car trains, to acquire 100 new steel cars suitable for subway as well as elevated service, and to make certain changes in existing equipment to fit it for operation in longer trains. It is estimated that the proposed changes will increase the capacity of the downtown loop structure 15 to 20 per cent.

It is also planned to use not more than $2,000,000 from the new issue of stock to refund existing interest bearing obligations. At the completion of the present financing, the company will have the following securities outstanding:

| | |
|---|---|
| 7.8 per cent prior preferred stock, series A (now offered) | $5,000,000 |
| Preferred stock | None |
| Common stock | 20,329,500 |
| Adjustment debenture bonds due 1963, interest payable only if earned after dividends on prior preferred stock | 18,563,000 |
| Mortgage bonds and equipment obligations | *47,600,000 |
| | $91,492,500 |

*Exclusive of $1,029,000 bonds in sinking fund and $12,292,000 bonds in escrow with the Central Union Trust Company, New York, withdrawable only against future improvements upon Northwestern Elevated main line. No interest is payable on said escrow bonds while on deposit.

In its prospectus the company points out that the valuation of its property on the basis fixed by the Illinois Public Utilities Commission in 1921 is $90,499,756, which leaves an asset equity of $23,336,756 to cover the new prior preferred stock, after deducting $66,163,000 for outstanding mortgage bonds, equipment obligations and adjustment debenture bonds and without allowing for improvements to be made from the proceeds of the new stock.

The company's income statement for the year ended Dec. 31, 1923, follows:

| | |
|---|---|
| Gross earnings | $18,146,305 |
| Operating expenses, taxes, rentals and depreciation or retirement reserve of $483,813 | 14,809,176 |
| Net earnings | $3,337,129 |
| Interest charges (after eliminating interest on the floating debt retired in the consolidation on Jan. 9, 1924) | 2,184,549 |
| Net income (available for prior preferred dividends) | $1,152,580 |

## Winona Interurban to Be Sold May 29

Judge W. B. Hile of the Superior Court at Elkhart, Ind., has granted the petition of Clarence J. Minton, receiver, for permission to sell the property of the Winona Interurban Railway. The order directs that the property shall be offered at public sale at the Court House in Elkhart on May 29 for not less than $150,000 for the Goshen division and a similar amount for the Peru division.

As noted briefly in the ELECTRIC RAILWAY JOURNAL for April 5, page 561, practically all the bonds of both divisions of the road were purchased recently by Harry Reid and James P. Goodrich in anticipation of foreclosure. It is their intention to tie in the road under an operating agreement with the lines of the Interstate Public Service Company for through operation of trains from Louisville through Indianapolis to South Bend and Chicago.

**Extra Dividend Declared.**—An extra dividend of 75 cents a share in 6 per cent cumulative preferred stock has been declared on the common stock of the Federal Light & Traction Company, New York, N. Y. This is in addition to a quarterly cash dividend of $1 a share, both payable July 1 to holders of record June 14. Similar amounts were paid April 1, 1924. From April, 1923, to January, 1924, inclusive 75 cents in cash and 75 cents in 6 per cent preferred stock were paid quarterly on the common shares.

**$1,250,000 Issue Extended and Sold.**—Dillon, Read & Company, New York, announce the sale at 100 and interest of $1,250,000 of extended consolidated mortgage 5½ per cent gold bonds of the Hestonville, Mantua & Fairmont Passenger Railway, included in the system of the Philadelphia Rapid Transit Company. The issue consisted originally of 3½s and 5s due May 1, 1924. The extended bonds now constitute a first mortgage.

**Auction Sales in New York.**—At the public auction rooms of A. H. Muller & Sons there were sold this week $5,000 Interborough-Metropolitan Company 4½ per cent collateral trust gold bonds, due April, 1956; April, 1921, coupons on, stamped; 2½.

**Reproduction Cost Established.**—Reproduction cost of the St. Paul City Railway as of 1922 has been put at $13,581,353 by A. L. Drum, consulting engineer for the company, at the hearing before the Minnesota Railroad & Warehouse Commission in St. Paul to obtain a permanent rate of fare. The original cost was as purchased $12,407,731.

**Deficit Increased Over 1921.**—For the three months ended March 31, 1924, the operating revenue of the International Railway, Buffalo, N. Y., was $2,599,338, against $2,725,159 for the same months in 1921. Operation and taxes decreased from $2,497,489 in 1921 to $2,412,380 in the current year. The net income was a deficit of $196,720 for the period of January-March, 1924. For the same period in 1921 the deficit was $140,314. The company explains that because of the strike in 1922 and its effect on the revenue and operating costs of the year 1923 the calendar year 1921 is used for comparative purposes.

**Reports Loss.**—The Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, is being operated at a loss, according to a report compiled at the general headquarters in Waterloo. The report for March, 1924, shows a loss of $11,779 as compared with $12,155 loss during the similar period a year ago. In 1923 the gross revenue was $16,925, while last March the total was $15,425. The operating expense was also greater in 1923 than in 1924. The report shows a profit in actual operation exclusive of taxes and interest requirements.

**Seeks Appointment of Receiver.**—Alleging default of payments of interest on a $1,200,000 bond issue, the Irving Bank-Columbia Trust Company of New York applied to the Federal Court in Columbus, Ohio, on May 9 for the appointment of a receiver for the Columbus, Newark & Zanesville Electric Railway. The petition also asks foreclosure on a mortgage covering $1,200,000 in bonds, a lien on all earnings of the company and the appointment of a receiver by the Federal District Court. The Girard Trust Company, trustee for the bondholders, is named party defendant in the action.

# Personal Items

## William M. Holland Resigns

William M. Holland has tendered his resignation as president of the Dallas Railway, Dallas, Tex. It is announced at the offices of other officials of the company that the vacancy will not be filled for some time. Mr. Holland, who is a former Mayor of Dallas, was elected president of the utility company ten months after the death of the late J. F. Strickland, who, with C. W. Hobson, secured the present franchise under which the railway company is authorized to earn 7 per cent on its invested capital.

In announcing the resignation of Mr. Holland, C. W. Hobson, chairman of the board of directors, said he would continue to act as head of the utility until a successor to Mr. Holland was elected, which may not be for several months. Richard Meriwether will continue to serve as vice-president and general manager. Mr. Holland stated that he would devote all his time to his law practice.

## H. E. Vordermark and H. Bucher Advanced in Fort Wayne

Reorganization of the executive staff of the Indiana Service Corporation, Fort Wayne, Ind., made necessary by the recent resignation of S. W. Greenland, vice-president and general manager, was completed on May 9. In the general operating staff H. E. Vordermark, who has been secretary and treasurer of the company since the reorganization in 1920, becomes vice-president and treasurer in charge of finances and purchasing. Henry Bucher, connected with the local organization for the past eight months, assumes charge of the railway management of all lines under the service corporation system. R. L. Fitzgerald takes over the management of the light and power department. The changes, according to Robert M. Feustel, president of the company, will put the operating problems of the Indiana Service Corporation in the hands of two experienced engineering executives and the financial affairs under the direction of Mr. Vordermark, who has had thirty years' experience in such work locally.

The new vice-president and treasurer has been in the employ of the company since July, 1893, starting in as private secretary to Stanley Robinson, who was then vice-president and general manager of the old Fort Wayne Electric Railway, later changed to the Fort Wayne & Northern Indiana Traction Company. In 1898 he was appointed auditor and retained this position when the company was consolidated with the Fort Wayne & Wabash Valley Traction Company. The Fort Wayne & Northern Indiana Traction Company later acquired this property and Mr. Vordermark was made auditor and secretary. Later he was elected vice-president and treasurer of the company. He is the oldest executive in the corporation service and knows the properties and their possibilities better than any other man in the company. He was born and reared in Fort Wayne.

H. E. Vordermark

Henry Bucher, who assumes the title of manager of railways is a railway engineer who has been in Fort Wayne handling special railway operating problems for the past eight months. He has a wide engineering experience, having been engaged in construction and utility operating work in various parts of the United States and Canada. Following a service of two years in United States Government construction work in the Southwest, he became assistant engineer of the Railroad Commission of Wisconsin, leaving that work in 1913. Later he was engaged in valuation work, special traffic and operating problems on the Bay State Street Railway, Boston, and on Pittsburgh and Philadelphia railway properties, the Nashville railway and lighting properties and a number of other smaller properties. The Fort Wayne Company operates 199 miles of electric railway, 139 of which are interurban and 60 of which are city. It does a general power and lighting business.

Henry Bucher

## Mr. Pharo to Enter Business for Himself

H. A. Pharo has resigned as superintendent of lines of the Pittsburgh Railways to enter business for himself on June 1 in Pittsburgh. He has organized the Pharo Engineering Company, with offices at 517 Park Building, and has secured a broad charter under Pennsylvania laws permitting the company to engage in many correlated activities, including selling. Mr. Pharo is convinced there is a good field in the Pittsburgh district for a manufacturers' representative company to handle certain lines heretofore marketed only through the medium of a factory sales organization. Mr. Pharo has long been connected with the Pittsburgh Railways. He is a member of the committee on power transmission and distribution of the American Electric Railway Engineering Association.

**George L. Lucas**, who has been acting chief executive officer of the New York Transit Commission since the resignation of General Lincoln C. Andrews last year, will naturally go with the new city board of transportation when the transfer of the construction work from the commission to the new board is made on July 1. The appointment of Major Phillip Mathews to the position of chief executive officer, as noted in this paper last week, was a step in the reorganization attendant upon this transfer. Mr. Lucas has been a member of the rapid transit engineering staff for more than twenty years and during most of that time he has been in charge of the important work of material inspection. The appointment of Major Mathews has been made now so that he might have reasonable opportunity to familiarize himself with the work before the division of functions of July 1 and while Mr. Lucas remained an employee of the transit commission.

**Carl H. Allen** has been appointed superintendent of the Illinois Traction, Inc., with headquarters at Ottawa, Ill. This position has recently been created. All department heads will report to Mr. Allen except the head of the traffic department, who will continue as before to report to the general manager of the company.

**Baxton Blasser** has been appointed chief electrical engineer of the Kansas City Railways, Kansas City, Mo., to succeed R. L. Weber, who has become connected with Stone & Webster.

**J. C. Schade**, who for several years has been general manager of the Winona Interurban Railway, Warsaw, Ind., has accepted a position with the Wisconsin Public Service Corporation as manager of railways. He left May 12 for Green Bay, Wis. After foreclosure the Winona Interurban will pass to interests represented by Harry Reid and J. P. Goodrich, as noted elsewhere in this issue. For many years Mr. Schade has been active in the welfare of both Warsaw and Winona. It was in 1910 that he was placed in charge of the Winona Electric Light & Water Company and still later was placed in charge of the finances of the Winona Interurban Railway with the title of assistant treasurer. Mr. Schade remained in this capacity until the receivership in 1916 and was then appointed comptroller by the receiver, serving in that position until 1917, when he was appointed general manager in direct charge of the property. It is probably a reflection of his managership that a comparison of the seven and a half years' operating record of the Winona company with other interurban lines shows that the Winona Interurban has been operated from 2 to 5 cents less cost per car-mile.

**G. W. Fry** was elected president of the Southwestern Public Service Association at its recent convention in New Orleans. Mr. Fry is general manager of the Abilene Traction Company, Abilene, Tex., and other properties of the American Public Service Company.

## Obituary

**Fred R. Cooper**, general sales manager of the Gold Car Heating & Lighting Company, Brooklyn, N. Y., died at his home in Washington, D. C., on May 10, after a short illness.

**Henry Haven Windsor**, editor and publisher of *Popular Mechanics*, died on May 12 at the age of sixty-five in Evanston, Ill. He is survived by his wife and one son, H. H. Windsor, Jr., now president of the magazine company. Mr. Windsor entered the service of the Chicago City Railway (South Side lines) in 1883 as secretary. Before this he had been private secretary to an official of the Northern Pacific Railway, St. Paul. While with the Chicago company he founded, edited and became president of the *Street Railway Review*. In 1901 he sold out his interest in that publication to Fred S. Kenfield, with whom he had been associated. The *Street Railway Review* was again sold in 1906 to Hugh M. Wilson, who changed the name to *Electric Railway Review* and made the paper a weekly instead of a monthly. He in turn sold it, in 1908, to James H. McGraw, who combined it with his *Street Railway Journal*, forming the present ELECTRIC RAILWAY JOURNAL. Following Mr. Windsor's association with the *Street Railway Review* he founded *Popular Mechanics*, of which he had been editor and publisher since 1901. Mr. Windsor was born in Mitchell, Iowa, in 1859, the son of a clergyman. He had two years training at Grinnell College, followed by a city editorship of the *Times-Republican* of Marshalltown, Iowa.

**Warren Young Soper**, president of Ahearn & Soper, Ltd., Ottawa, Ont., electrical engineers and contractors, died on May 13 at Ottawa. Mr. Soper was one of the electric railway pioneers of Canada. He was connected for many years with a large number of Canadian corporations. He had been a director of the Ottawa Car Company, vice-president of the Ottawa Street Railway and at times was connected as an officer or director of many other public service and manufacturing companies operating in the Dominion.

# Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

## More Cars to Be Purchased for Detroit

Detroit is on the eve of awarding another order for street cars. Bids will be opened on the morning of May 20. Later the same day the Detroit Street Railway Commission will meet to go over the bids. It appears likely that an order for new equipment will be placed at once. This includes a probable order for ten additional articulated units. The present articulated train has proved to be popular with both railway officials and public. It is being run regularly in the rush hours on Woodward Avenue.

This latest talk in regard to cars for Detroit has focused attention directly on this whole matter. For months now, in fact ever since the local road was taken over by the city, there have been rumors and still more rumors regarding the probable purchase of cars for Detroit. It hasn't all been talk either. There have been some nice orders for equipment. In fact, Detroit's appetite for cars has appeared to be insatiable. The end is apparently nowhere in sight. In 1922 Detroit ordered 200 cars and in 1923, not including some special type equipment, the city ordered 150 cars. So far this year contracts have been let for seventy-five cars. In addition the city is building twenty-six trailers in its own shops. Unofficial figures place the value of the new equipment purchased by the city at about $4,000,000.

Despite all this the Department of Street Railways is short of cars. In fact, the department is still renting a few cars from the Detroit United Railway, though most of the equipment originally taken over under the leasing arrangement has been returned to that company. As for the future, there is a larger number of old cars destined for the scrap heap than has gone that way in the past, but these cars are being kept in service until new rolling stock is available.

## Metal, Coal and Material Prices

| **Metals—New York** | May 13, 1924 |
|---|---|
| Copper, electrolytic, cents per lb. | 13.175 |
| Copper wire base, cents per lb. | 15.625 |
| Lead, cents per lb. | 7.40 |
| Zinc, cents per lb. | 6.225 |
| Tin, Straits, cents per lb. | 46.125 |
| **Bituminous Coal f.o.b. Mines** | |
| Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons | $4.425 |
| Somerset mine run, Boston, net tons | 2.125 |
| Pittsburgh mine run, Pittsburgh, net tons | 1.875 |
| Franklin, Ill., screenings, Chicago, net tons | 2.175 |
| Central, Ill., screenings, Chicago, net tons | 1.90 |
| Kansas screenings, Kansas City, net tons | 2.50 |
| **Materials** | |
| Rubber-covered wire, N. Y., No. 14, per 1,000 ft. | $6.50 |
| Weatherproof wire base, N.Y., cents per lb. | 17.50 |
| Cement, Chicago net prices, without bags | $2.20 |
| Linseed oil (5-bbl. lots), N.Y., per gal. | $0.97 |
| White lead, in oil (100-lb. keg), N. Y., cents per lb., carload lots | 12.25 |
| Turpentine (bbl. lots), N. Y., per gal. | $0 91 |

## Railways Interested in Purchase of Traffic Signals

Electric railways all over the country are manifesting considerable interest in traffic signals. The installation and use of such signals is primarily a city function, but the extension of their use is a matter directly affecting the railways because of the ever-increasing demands being made upon street space by the growing number of vehicles seeking accommodation on the highways. Perhaps the case of the Cleveland Railway, operated under service-at-cost, is a little different from that of most other companies in that the city has a direct interest in the welfare of the company, but be that as it may, the Cleveland Railway is buying a number of traffic signals after having tried some home-made ones. The city of Cleveland will operate the new devices. Among those so far specified by the company are two from Crouse-Hinds, seven from Essco at Peoria and two from Nichols-Lintern.

While all these installations are primarily up to the city authorities, the railways will have a good deal to say about them. The Cleveland Railway is also pioneering in safety zone protection. It has ordered an installation with collapsible posts, made by the Griswold Safety Signal Company, Minneapolis. It is understood that the order of the railway for equipment of this type is for five of these safety zones. Five others will be protected by flood light.

## Chicago Surface Lines Orders 100 New Cars

As a result of contracts awarded last week 100 new cars costing approximately $15,000 apiece will be added to the rolling stock of the Chicago Surface Lines. Of this number fifty are to be built in the company's West shops and fifty will be built by the Lightweight Noiseless Electric Street Car Company, Minneapolis, organized by A. L. Drum. The latter cars will be built in the shops of the Twin City Rapid Transit Company, Minneapolis. Deliveries will be made beginning Aug. 15 and completed by Oct. 15 next.

All these cars will be built according to the specifications of the Chicago Surface Lines and will not embody any of the features of the so-called "noiseless construction" which has been tried at Minneapolis. The use of band brakes and roller bearings and a car weighing only 25,000 lb. are the features which the Minneapolis company has considered would produce a more quietly running vehicle than the conventionally designed car.

The equipment to be used on the Chicago cars is the same as that described in the April 12 issue of the ELECTRIC RAILWAY JOURNAL when bids were sought. In addition to the information published then, General Electric air compressors, G. E. type M control, Tomlinson couplers, Duquad curtain fixtures, Fabrikoid curtains, Trolley Supply Company headlights and trolley catchers have been specified. The seats will be the St. Louis Car Company type. Brill 39-E trucks with Illinois Steel Company wheels and Carnegie Steel Company axles will be used. Motors will be G. E. 275.

## *Rolling Stock*

**Ottawa Electric Railway, Ottawa, Canada,** recently placed an order for twenty passenger cars. This order is this year's allotment of the forty-seven the company was called upon to provide under its new contract. The cars are known as "pay-as-you-leave" cars, but in practice they are "pay-as-you-pass," as it is found in other places where they are used that more than 80 per cent of the fares are collected before the car stops to discharge passengers. With their introduction the near-side stop will be adopted in Ottawa. Passengers enter at the front and leave by the rear. The detailed specifications follow:

| | |
|---|---|
| Date of order | May 3 |
| Date of delivery | Aug. 15 |
| Builder of car body, | Ottawa Car Manufacturing Company |
| Type of car, | Motor, semi-convertible, passenger |
| Seating capacity | 52 |
| Weight: | |
| Car body | 19,000 lb. |
| Trucks | 11,700 lb. |
| Equipment | 8,050 lb. |
| Total | 38,750 lb. |
| Bolster centers, length | 20 ft. |
| Length over all | 45 ft. 3¾ in. |
| Truck wheelbase | 5 ft. 4 in. |
| Width over all | 6 ft. 5 in. |
| Height, rail to trolley base | 11 ft. 2⅞ in. |
| Body | All steel |
| Interior trim | Cherry finish |
| Headlining | Panelite |
| Roof | Monitor deck |
| Air brakes | Safety car type |
| Armature bearings | Bronze |
| Axles | 4½ in. |
| Bumpers | Hedley anti-climbers |
| Car signal system | Consolidated |
| Car trimmings | Bronze |
| Center and side bearings | Friction |
| Conduits and junction boxes, | Northern Electric |
| Control | GE-K35 |
| Couplers | Hovey |
| Destination signs | Keystone |
| Door-operating mechanism, | National Pneumatic |
| Fare boxes | Cleveland No. 5 |
| Lifeguards | H-B |
| Gears and pinions | Nuttall helical |
| Hand brakes | Ackley staffless |
| Heater equipment | Consolidated |
| Journal bearings | Friction |
| Journal boxes | Canada Car Company |
| Lightning arresters | Westinghouse |
| Motors | Westinghouse, 514A, inside hung |
| Sanders | Ohio Brass |
| Sash fixtures | Ottawa Car Mfg. Co. |
| Seats | Ottawa Car Mfg. Co. |
| Seating material | Rattan |
| Slack adjuster | Westinghouse |
| Springs | Half elliptic and coil |
| Step treads | Mason |
| Trolley catchers | Eclipse |
| Trolley base | Nuttall No. 11 |
| Trolley wheels, | Ottawa Car Manufacturing Company |
| Trucks | Canada Car Company |
| Ventilators | Nichols-Lintern |
| Wheels | Chilled steel, 26 in. |

Special devices, etc.:
Traffic signal lights.
Special signal light on front of car to indicate starting of car.

**Cleveland Railway, Cleveland, Ohio,** is building sixteen trailers at its Harvard Avenue shops.

**Indiana Service Corporation, Fort Wayne—Union Traction Company, Anderson,** is contemplating, it is reported, the purchase of about ten all-steel interurban cars. The cars, it is understood, will be of the model recently developed by A. W. Redderson, superintendent of motive power of the Indiana Service Corporation. Ten of these are already in service on the Fort Wayne-Van Wert and the Fort Wayne-Decatur lines.

**Grays Harbor Railway & Light Company, Aberdeen, Wash.,** has purchased a new car for use between Aberdeen and Cosmopolis.

**New Orleans Public Service, Inc., New Orleans, La.,** is rebuilding a number of its double-truck cars for train operation on the Spanish Fort line. The motor cars will be equipped with four G.E. 67 motors per car and will pull one, two, or three trail cars. Automatic air connections with door interlocking mechanism through Tomlinson couplers will be provided. The trailers are rebuilt open cars, but will have windows and sash for use in winter on heavy industrial lines.

## *Track and Line*

**Cincinnati, Ohio.**—Sealed proposals will be received at the office of the Board of Rapid Transit Commissioners, until June 6, 1924, for the construction of about 5.3 miles of rapid transit line, including 1,600 ft. of subway. The total estimated cost is approximately $1,000,000.

**New York, N. Y.**—The Board of Estimate has rejected the Transit Commission's award to the Oakdale Contracting Company, the lowest bidder for the construction of the first section of the new Brooklyn crosstown subway.

**Chicago Rapid Transit Company, Chicago, Ill.,** has started formal construction of the 5-mile elevated extension which will run through Evanston and Niles Center to Dempster Street. Preliminary construction work has already progressed to a considerable extent, including the building of a narrow-gage line and a trestle across the north shore channel for the moving of materials.

**Wisconsin Gas & Electric Company, Kenosha, Wis.,** has agreed to comply with the request of the city manager to repair the pavement between its tracks on Milwaukee Avenue as soon as local steam railway crossing work is completed.

**Duluth Street Railway, Duluth, Minn.,** will build this year 1½ miles of track to be known as the Kenwood extension. This new line will serve a fast-growing community and the extension has been ordered by the City Council to be completed and in operation by Aug. 1.

**Birmingham Electric Company, Birmingham, Ala.,** will pave along the car tracks on First Avenue from Forty-first Street to Fifty-seventh Street and from a point near Eightieth Street to Eighty-fifth Street. This was ordered by the City Commission. Estimated cost of the work is $138,400 and under an agreement recently reached by the city and railway this work will be done without any cost to the city. The cost of track reconstruction necessary before the paving is done, it is estimated, will make the cost something like $300,000.

## *Trade Notes*

**Worthington Pump & Machinery Corporation, New York, N. Y.,** has closed its power and mining works at Cudahy, Wis., "in order to concentrate our manufacturing facilities as much as possible." All lines of product will be transferred to the company's other works excepting only the mining, crushing, cement and creosoting machinery which will be discontinued.

**Allis-Chalmers Manufacturing Company, Milwaukee, Wis.,** has taken over crushing, cement, mining and creosoting machinery lines of the Worthington Pump & Machinery Corporation and will continue their manufacture at the West Allis Works. Special attention will be given to the prompt shipment of repair and spare part orders.

**The Pantasote Company, New York, N. Y.,** announces that W. A. Lake, who has been connected with the company for the past fifteen years, has been appointed sales manager of the railroad and marine department for the disposition of all Pantasote and Agasote products in those fields.

**Atlanta, Ga.**—The Beeler Organization, New York, has been engaged by the city of Atlanta to make a valuation of the railway property of the Georgia Railway & Power Company. This organization has been engaged for some weeks past in making a traffic study in Atlanta for the city and has made a preliminary report, which will shortly be reviewed in the JOURNAL.

## *New Advertising Literature*

**Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.,** has issued a twenty-four-page booklet describing and stating the application of various varnishes, insulating compounds and finishing materials. The booklet, which is known as Folder 4249 B, contains complete information for the user of insulating materials in these classifications and has been designed as a book for ready reference in the selection of such material. All of the materials described are used in the manufacture of Westinghouse electrical apparatus and are also made available to the general trade.

**Hubbard & Company, Pittsburgh, Pa.,** has issued a bulletin describing the complete Hubbard line equipment.

**Ramsey Chain Company, Inc., Albany, N. Y.,** manufacturer of the chain with the compensating joint, has issued a complete text book on power transmission, and silent chain transmission in particular. It treats of the comparisons between the various methods of drives, leather and rubber belting, gearing, direct drives and silent chain. It also covers many transmission problems.

New York, May 24, 1924

# Electric Railway Journal

*Consolidation of Street Railway Journal and Electric Railway Review*

Published by McGraw-Hill Company, Inc.

HENRY W. BLAKE and HARRY L. BROWN, *Editors*

*Volume 63*
*Number 21*

## Consultation of Transportation Men Needed in City Planning

A TRAFFIC conference was held in New York on May 20 under the auspices of the Committee on a Regional Plan for New York and Environs. Besides traffic discussion, progress reports were made on the various investigations of the committee, which is being financed by the Russell Sage Foundation to the extent of $100,000 a year for five years.

The existence of a non-partisan body of this character to study the physical needs of the communities in the metropolitan area, not in terms of any one municipality but in terms of the whole region, certainly is an excellent thing. With the efforts of the committee to secure the adoption of wise zoning laws and a limit to the height of buildings nearly everyone will be in full accord. And with the specification of the general purposes of the committee there can be nothing but praise on the part of the public or of transportation men.

Some of the methods advocated at this conference for attacking the traffic problem, however, do not inspire much confidence in the outcome of the committee's work with respect to this phase of regional planning. While the conference seemed primarily to be directed toward emphasizing the fact that the traffic situation is acute, if that needed to be told, the principal remedial measures suggested showed a disappointing lack of knowledge of the problems of mass transportation. They comprehended only the means to facilitate vehicular traffic.

Several speakers proposed the removal of all surface and elevated railways from the streets of Manhattan. Such a step would relieve vehicular congestion to a certain extent to be sure, but what would happen to the people who have to use the street railways and the elevated? If they rode in buses the congestion would be greater rather than less. It is easy to say, "put the tracks underground," but who would pay the fabulous cost?

According to the report of the consulting engineer of the committee, the removal of surface lines on Second, Lexington, Seventh and Ninth Avenues, the replacement of the Third and Sixth Avenue elevated lines with subways, and the widening of the roadways of Lexington, Park and Madison Avenues would increase the capacity of north and south avenues 67 per cent. The same report states that if no parking were permitted on any north and south avenue on Manhattan the resulting gain in traffic capacity would be 50 per cent. In other words, nearly as much relief could be afforded by parking restrictions at no cost as would be accomplished by building miles of subway at enormous expense.

If any solution of the traffic problem is to be expected in New York or any other city, the co-operation of transportation men is needed. They have been wrestling for years with the problem of congestion and have a real grasp of what is involved in effecting improvements. More good would result from conferences with these practical men than will be likely to come from idle talk of making New York "a modern Venice" with the arteries of traffic filled with gleaming motor cars instead of water and gondolas, the railways all underground and pedestrians wandering through artistic second story arcades and over graceful bridges spanning the streets.

## Keeping Riders "Sold" After Delays

THE merchandising methods used on many railway properties for selling rides to the people of the community could to advantage be carried a step farther to cover specific cases where riders need to be resold on the transportation company after an interruption to service. It would be helpful in such cases to inform the riders as to the cause of the delay and perhaps the work done in clearing the trouble. There is nothing to suppress, for delays will occur. The public knows that anything mechanical is subject to failure, and that things beyond the control of the railway often interfere with the movement of the cars. But with knowledge of the cause, there would exist a much more tolerant attitude.

One step in doing this is to have the trainmen inform passengers as to the nature of the trouble and how long the cars are likely to be tied up. For the benefit of patrons waiting for cars, it might be possible often to have the route traversed by an automobile and inform those waiting of the probable extent of the delay. This would enable those in a hurry to save time by promptly seeking parallel routes or other means of transportation. Next day the cars on that route could be provided with posters or handbills explaining the cause of the delay.

This latter method has been used by some of the suburban railroads operating into New York City. Passengers on one road were recently told the reason for an hour's delay one morning and also the method employed, that of rerouting the trains, to get the passengers to their destination. In this instance the rerouting, while done promptly, proved of no avail because the rerouted trains met with another delay. These difficulties were explained in handbills placed in every seat on all trains operating over the delayed division in the evening rush hours that day.

There is little doubt that the passengers of the delayed trains, although greatly inconvenienced during the incident, were somewhat appeased by the explanation given by the railway company, as it showed that an earnest and prompt attempt had been made to keep the trains moving.

Transportation must be sold again and again. Especially is this true after a delay. Whatever is done then to appease waiting patrons tends to keep them sold on the impression that the management is awake and responsive to the need for continuous service, that it is quick to handle emergency situations—in general, that the management is "on the job."

## Distributed vs. Concentrated Terminals for Suburban Traffic

IF THE plan for caring for suburban traffic in the New York Metropolitan district, proposed by Mr. Turner and outlined in the issue of this paper for May 10, were financially possible of execution, it would be the largest example of the distributed terminal plan for this kind of travel. From the standpoint that the plan contemplates distributed terminals rather than a concentrated terminal, the principle embodied in Mr. Turner's proposal is a sound one. The commuter does not need the elaborate waiting and baggage accommodations provided in the monumental stations which many of the steam railroads have thought it necessary in the past to erect. While he wants to travel between his home and his place of business comfortably, he wants to do so in the shortest space of time, and this he can best do by trains which, at least during the rush hours, will operate as rapid transit trains in the city and as suburban expresses in the country.

In one respect the time is favorable in New York for such an installation. The passenger capacities of the Pennsylvania-Long Island terminal and of the Grand Central station are already in sight. To increase their accommodations for passengers would be enormously expensive, but if done it would neither relieve the commuter situation on any of the lines on the west, except the Pennsylvania, nor help in the distribution of any of the commuting passengers in New York after their arrival.

New York needs more subways. There is no question about that. According to Mr. Turner, at a cost only about 50 per cent more than that for doubling the capacities of the Pennsylvania and Grand Central stations, his plan would relieve the pressure on those stations for through passengers for many years to come, the congestion at the terminals of all the trunk lines bringing commuters to New York would be removed and the city would have 61½ miles of added rapid transit line.

In principle the plan proposed by Mr. Turner is not greatly different from that now being followed on a much smaller scale in London, where a number of trunk lines operate their suburban trains through the Metropolitan and Metropolitan District subways. Another precedent is the use of the Chicago elevated railway by the North Shore Line and the Chicago, Aurora & Elgin trains. Still another precedent is that in New York.

Up to 1898 all of the lines in Brooklyn carried their passengers only to the East River. Then a transfer had to be made to some other agency, either ferry or the cable railway on the Brooklyn Bridge for transit to Manhattan. This corresponds to the present situation in New Jersey for all the lines except the Pennsylvania. The next step in Brooklyn was to run through trains from Brooklyn over the Brooklyn Bridge but to discharge these passengers at one point, i.e., at the end of the bridge. This is what the Pennsylvania, Long Island, New York Central and New Haven roads now do in their two stations. The final step in the Brooklyn case was to run through trains from Brooklyn distributing their passengers throughout the business district of Manhattan. Looking back at the Brooklyn situation, one can easily realize that the final solution was the proper one. It is this same answer which is now proposed for the larger commuter problem now confronting New York.

As explained editorially in these columns two weeks ago, many matters still remain to be determined. One of the most serious is the division of the enormous expense involved. Another is the choice of routes within the city and to some extent without the city. The plan was put forward avowedly to start discussion and it should receive earnest consideration.

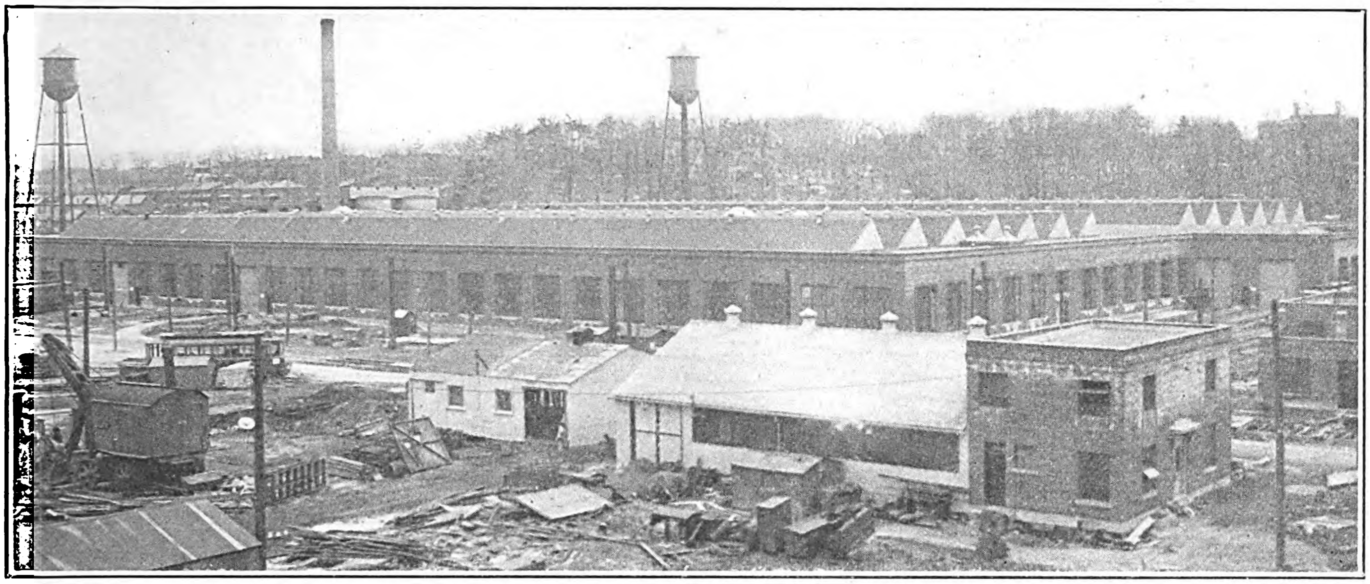
## Seeking Patronage of Auto Owner Is of Questionable Profit

CONSIDERABLE attention has been paid recently to methods of inducing the business man to leave his automobile at home and use the trolley. Such business may be profitable to the company, provided no additional cars have to be operated on his account. But there is a limit to the amount of business that can be added at the peak hours without involving increased expense.

If the schedules are efficient, the cars will be loaded in the rush hours up to the standard, whatever that may be in any community. At these peak periods transportation is furnished at the greatest cost. It is a famous myth that "the straphangers pay the dividends." As a matter of fact, these same straphangers are usually the most expensive patrons of the road. The entire system has to be designed with sufficient capacity to carry the maximum load that presents itself. This means cars, power, tracks and operators have to be sufficient in size and number to carry about half the total business of the day in some three or four hours out of eighteen or more that the cars are in service. Even with standards of loading calling for perhaps two passengers to every seat in the rush, the average city system operates two to three times as many cars then as in the non-rush hours.

It is easy to see that here is a large investment used just for a small period. Fixed charges on it are likely to be a large part of the total cost. Furthermore, extra men are needed whose working conditions are decidedly poorer the greater the relative number of rush hour cars, and the proportion of time paid for but not worked increases.

While this seems to be discouraging to the company that is making an effort to enlist the automobile owner as a patron, there is a silver lining to the cloud. The absence of parked vehicles on the car line streets and less vehicles moving on the tracks or holding up the cars at the intersections make it possible to maintain higher schedule speeds. And winning the patron for the rush hour may likewise produce many profitable non-rush rides, for it is only in the larger cities that the mid-day schedules are determined by the loading, and usually there is plenty of room in the cars. The best type of patron to try to induce to ride the trolley rather than the private automobile is the housewife shopper. Her patronage is distinctly an addition to the non-rush riding and therefore clearly profitable, even though it should require more cars, because the cars are available.



The Toronto Car Repair Shop, in the Background, Is the Largest Building in the Group, Covering 4 Acres. In the Foreground Are the Way Department's Yard Office, Frog Shop and Blacksmith Shop

# Toronto's New Shop and Material Yard

### Provision Is Made for Car Repair Work, Material Storage for the Way Department and General Stores for the Railway—Eight Permanent Buildings Have Been Constructed on a 22-Acre Plot, with Trolley and Steam Railroad Track Connections—Entire Group of Buildings Is Heated by Central Steam Plant

THE new Hillcrest shops of the Toronto Transportation Commission were recently put in commission after a construction period lasting over a year. Provision is made primarily for the repair work on rolling stock. Space is also allotted to the maintenance of way department for a material storage and track layout yard. In addition, there is on the property a garage for the emergency wagons and a stores building containing general stores for the railway and also for the Toronto Hydro-Electric Commission, which distributes electrical energy locally in the city.

The property is located on the west side of Bathurst Street, between Davenport Road on the north and the main line of the Canadian Pacific Railway on the south. It is about 930 ft. wide, the depth varying from some 890 ft. at the east side to 1,110 ft. at the west side. The total area included is 22.24 acres.

The property is served directly by a siding from the steam railroad. The gage of the Toronto tracks is, however, the odd figure of 4 ft. 10⅞ in., making it very difficult to provide joint track facilities. Accordingly, the two sets of tracks have been kept separate as far as possible, there being only a few pieces of gauntlet track where it was necessary to have both services.

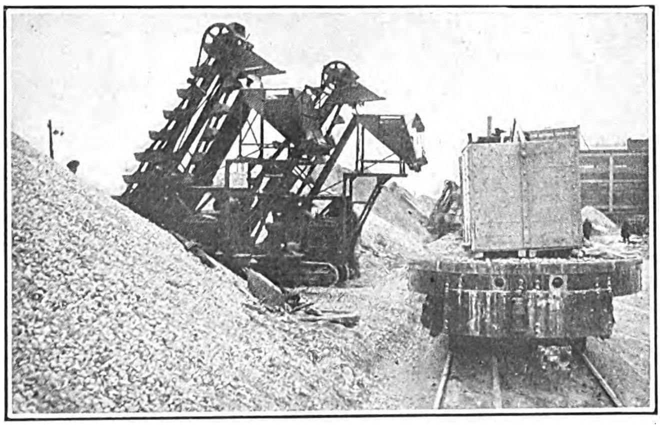
All told there are eight separate permanent structures on the property, as follows:

Main shop building, one story, 467 ft. x 452 ft.
Administration office building, two stories, 82 ft. x 51 ft.
Stores building, four stories, 299 ft. x 115 ft.
Garage for emergency trucks, one story, 140 ft. x 53 ft.
Cement building, two stories, 113 ft. x 63 ft.
Frog shop, one story (office two stories), 85 ft. x 40 ft.
Building maintenance shop, one story, 114 ft. x 40 ft.
Boiler house, one story, 87 ft. x 45 ft.

There are also several temporary buildings for various purposes.

In general, the permanent buildings have structural steel frames, concrete foundations, and floors, brick walls, steel sash and pre-cast gypsum roofs.

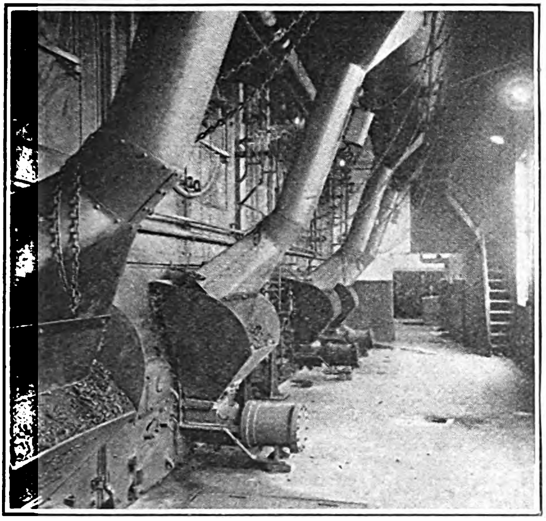
Detailed consideration of the shop building will be given in a separate article to appear in a later issue, so that it will not be described here.

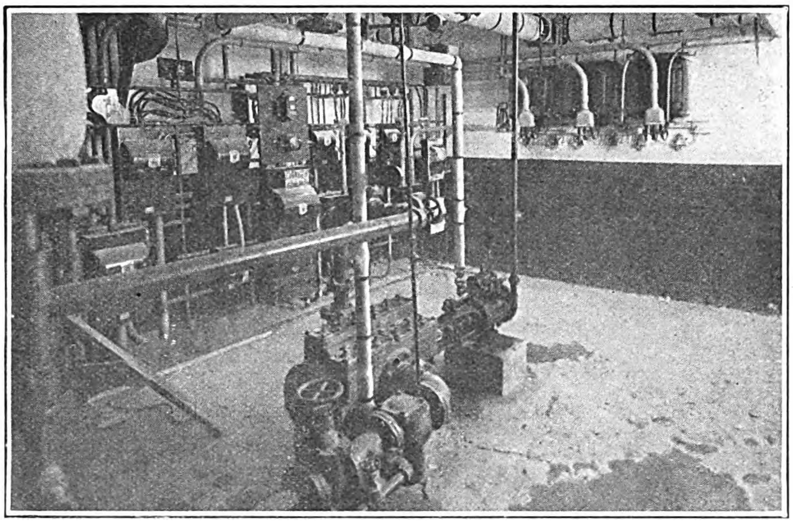


Track Materials Are Stored at the South End of the Material Yard and Are Loaded by Barber-Greene Loaders

The offices for the rolling stock department are located in the administration building, the entire second floor being assigned to the superintendent of equipment and his staff. On the first floor quarters are provided for the employment department and the medical staff.

The general stores building is at the southeast corner of the site, fronting on Bathurst Street. It is of reinforced concrete flat slab construction, 306 ft.





The Heating Is Done by Four 300-Hp. Boilers with Underfeed Stokers, as Shown at the Left. The Mechanical Equipment Room in the Stores Building, Shown at the Right, Is at the Terminus of the Heating Tunnel

such as to facilitate the issue of and accounting for supplies.

On the third floor space has been reserved for a suite of instruction rooms for trainmen. It is planned to install working models of portions of the railway equipment so that the students can get training in actual operation.

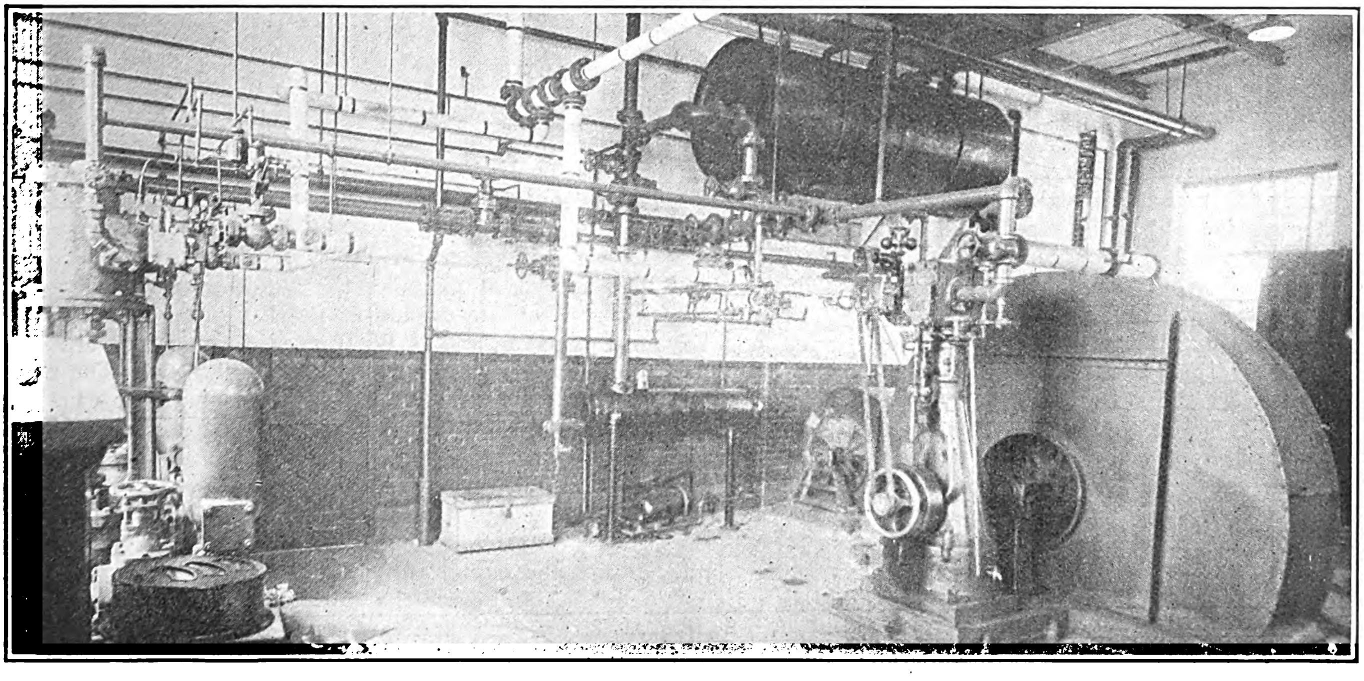
Two automatic push-button freight elevators with micrometer control are installed in the center of the building, and provision has been made in the framing for two additional elevators in case the height of the building is increased.

Immediately west of the administration building is a garage in which are housed the emergency trucks and equipment belonging to the way and line departments. Space also is allotted for the inspection and repair of this equipment and for gasoline and oil service.

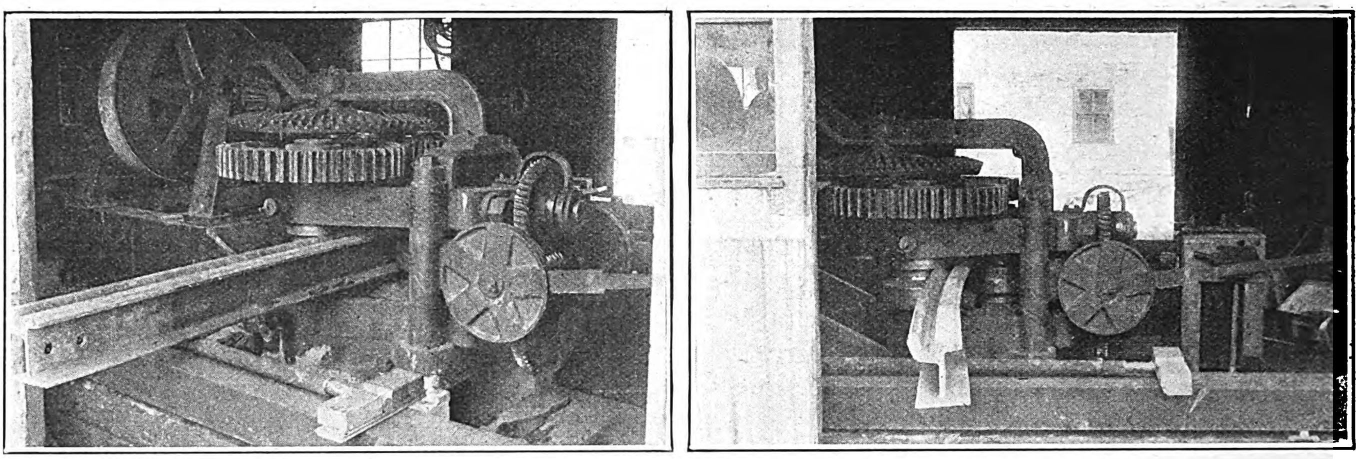
The entire group of buildings is heated from a central boiler plant located west of the car shops. Four 300-hp. boilers with underfeed stokers supply steam at 100 lb. pressure. The steam and electric driven blowers, pumps and compressed air plant also are located in the boiler house. The steam is distributed through a tunnel system running directly east from the boiler house and through the car shops, passing just south of the transfer table, between it and the track pits. In this way the tunnel is practically open for a considerable portion of its length, so that inspection is facilitated. Passing out of the shops, the tunnel goes under the administration building and across the roadway to the stores building. The tunnels also provide for all other service piping and electric wiring.

Just north of the boiler house there is a complete coal and ash handling plant. Coal is stored in two concrete storage bins, one for steam coal and the other holding anthracite for use in the Peter Smith car heaters. These bins are fed from a track hopper with an apron feeder and elevator conveyor. A flight conveyor connects the bins with the boiler house coal bunkers, allowing the coal to be fed directly into them. Special ash handling equipment facilitates the removal of the ashes from the boiler room to Differential motor dump cars.

Fire protection is provided by means of an automatic sprinkler system throughout the buildings and a sys-



The Engine Room in the Heating Plant Contains the Pumps and Blowers



The Rail Bending Machine, Installed in the Layout Yard, Will Bend the Heaviest Rails Used in Toronto to Any Radius

tem of fire hydrants in the yard. This system normally is fed direct from the city water system. To provide an auxiliary supply and insure ample protection in case of failure of the city supply a tank of 100,000-gal. capacity has been erected at the northwest corner, which is the highest point on the property. This is filled by the city pressure, but is arranged with an automatic cut-off valve, which closes immediately if the city pressure fails, preventing the water from feeding back into the city mains. It is estimated that the capacity of the tank is sufficient to control a fire for two hours.

Outside the shop sufficient room has been reserved to provide storage space for cars awaiting repair and those ready for service. Test tracks are included so that the completed cars may be given a thorough tryout under operating conditions before being given final approval.

Paved roadways are installed wherever necessary so that trucks or teams can reach practically any point in the yards. In this way three methods are available for handling material—steam train, electric cars and trucks. In general these paved roadways follow the lines of the tracks, although the tracks are principally of open construction and are not paved.

When the property was purchased it was sloping, being on the side of a hill. The north end was some 30 ft. higher than the south end. It was necessary to do a great deal of excavation and grading to make it suitable for the shops and yard. A datum was established about midway, opposite the Bathurst Street entrance, and the grading was done to that level. In that way almost enough material was excavated to nearly fill in the material yard to the same level as the shop section, although there is still a slight grade.

Materials for track construction are stored at the south end of the yard in convenient piles of pit run gravel, sand, trap rock, crushed gravel, screenings for tamping and crusher run. These piles are so arranged that they are reached on the south side directly by the steam railroad cars and on the north by the commission's cars. This makes it possible to load and unload material at the same time without interference.

The cement building is used for the storage of cement, dry sand and salt. The basement beneath is devoted to a sand drying plant, in which all the sand needed for the cars is prepared. Immediately adjoining this building is a shed used for sand-blasting cars or other apparatus.

The frog shop is used for the repair of special work, or for the construction of any small piece of special trackwork that has to be made for emergency. Adjoining this shop is a layout floor in which any piece of trackwork can be set up and fitted preparatory to installation, insuring that all the parts are correctly made and there will be no delay due to fitting parts.

To the south of the layout floor is a rail bender, which is shown in an accompanying illustration. This bender is of heavy construction and is capable of handling the heaviest girder rails in use. By using special rolls for each section it is possible to bend the rail without distorting it, so that curves of any radius can be laid out accurately.

In the equipment shed are housed all the pieces of construction machinery that are liable to injury from the weather, except some of the heavier cranes. This makes it possible for a repair crew to work on them during the winter and place them in good condition for the coming season. It also makes it possible to retain the better mechanics, as they can be given employment the year around.

Ties are stored in piles near the center of the material yard. There is a gauntlet track on either side of the tie storage, so that access is convenient. Special ties are stored separately, so that they will not be mixed up with the others. A similar storage space is allotted to granite paving sets, which are standard with the commission.

Loading of sand, gravel and similar materials is done by means of Barber-Greene loaders, which are used largely in connection with track construction and at various points about the yard.

The cost per cubic foot of the general repair shops and the boiler house was 14 cents and of the general stores building 22¾ cents.

The work of planning the buildings was done under the general supervision of H. H. Couzens, former general manager, and D. W. Harvey, formerly his assistant and now general manager. The design was done under the direction of W. E. P. Duncan, engineer of structures. James H. Lowry was resident engineer in charge of building construction.

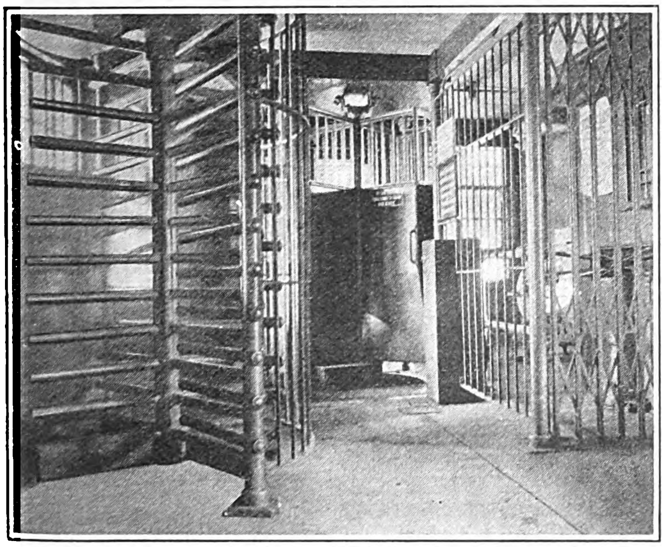
The shop layouts were planned by W. R. McRae, superintendent of rolling stock. Charles A. Remelius of New York was special consultant on problems of shop design and equipment. The layout of the way department buildings and the storage yard was supervised by A. T. Spencer, assistant to the general manager and way engineer.

# Automatic Passimeter Station

### No Operator or Change Attendant Is On Duty During Off-Peak Periods—Iron Fences and Gates Direct Traffic—Additional Turnstiles Used in Rush

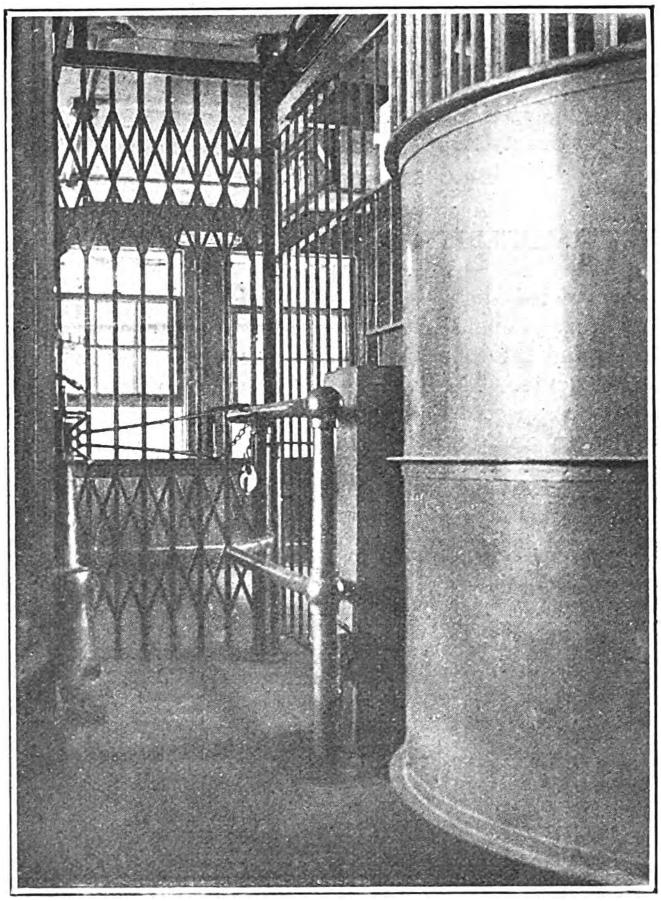
A LARGE number of the elevated stations of the New York Rapid Transit Corporation have entrance and exit facilities at either end. At some of these stations in sparsely settled communities it frequently happens that one end of the station is little used during off-peak periods, so that an attendant placed there to collect fares has little to do. To provide an automatic means of collecting fares at such points during non-rush hours the company has installed a number of automatic passimeter stations of a type shown in an accompanying illustration.

These stations are fenced off by iron fences and pantograph gates, so as to provide three passageways. In the accompanying illustration, the passageway to the extreme right, which is shown closed by a pantograph gate, is used during rush-hour periods, and an operator is stationed in the fare booth. This passageway is provided with a turnstile, which is released by the operator as each fare is paid, this operation registering the fare. The center passageway of the automatic station is used for entrance to the automatic passimeter. An iron fence is provided on either side which reaches from the floor to a support at the ceiling, so that it is impossible for any one to climb over or under this during the period when an operator is not on duty. An automatic fare box arranged to receive nickels only is placed in the iron fence at the right of this passageway and immediately in front of the passimeter. The construction of this fare box and the mechanism for releasing the passimeter and locking it is of the same type as was described in the ELECTRIC RAILWAY JOURNAL for Jan. 20, 1923, page 127.



Arrangement of Automatic Passimeter Station

The construction of the turnstile, however, is quite different from the one previously described, which has four wooden arms only. In the new design the turnstile is entirely inclosed to a height of about 5 ft., and from this point up to the ceiling it is closed with an open iron framework. Two sheet steel quadrants partially surround the turnstile, making it similar to a revolving door. Thus it is impossible for any one to get through by climbing over or under the turnstile, and the drum arrangement, which has but two passageways, is constructed so that but one person can pass through at a time. After depositing the fare in the slot of the fare box, so as to unlock the turnstile, a slight push starts it rotating, after which a spring centering device provides for its return to proper position to receive the next passenger.



Sheet Steel Drum and Entrance Passageway from Inside of Station

The third passageway of the station is used for exit of passengers and is provided with a four-arm turnstile, which has arms spaced vertically about 6 in. apart, and extends from the floor to the ceiling. The arms are of iron pipe construction and a ratcheting device on the turnstile prevents rotating except in the direction for exit. Stationary barriers are provided so that it is impossible to enter through this turnstile.

The entire construction of the automatic passimeter station is very strong. The iron fences are very substantial, and particular pains have been taken to provide a construction which will be entirely foolproof. Signs are provided at many locations to tell the passengers just how to enter and manipulate the automatic mechanism. A conspicuous sign is also displayed at the foot of stairways to notify passengers when an attendant is on or off duty, and also to inform them to be provided with exact change for operation of the automatic passimeter.

Another conspicuous sign at the top of the stairway is displayed only when the operator is on duty. During rush-hour periods a gate between the exit and center entrance passageways can be opened, so that exit passengers are not required to pass through the turnstiles, and both the right-hand and center passageways can be used for entrance passengers.

# Revolutionary Traffic Regulations in Philadelphia

### Parking Has Been Eliminated on Congested Streets and Safety Zones Established to Prevent Blocking of Standing Trolley Cars—All Vehicle Movements Facilitated

PHILADELPHIA is confronted with the problem of every day getting a million people into and out of a congested business district of less than 2 square miles in area. Considering the limited approaches from the west and the exceedingly narrow streets the problem is most acute. The increase in automobile traffic, which may be expected to continue, and the normal increase in business and in population emphasize the seriousness of the situation.

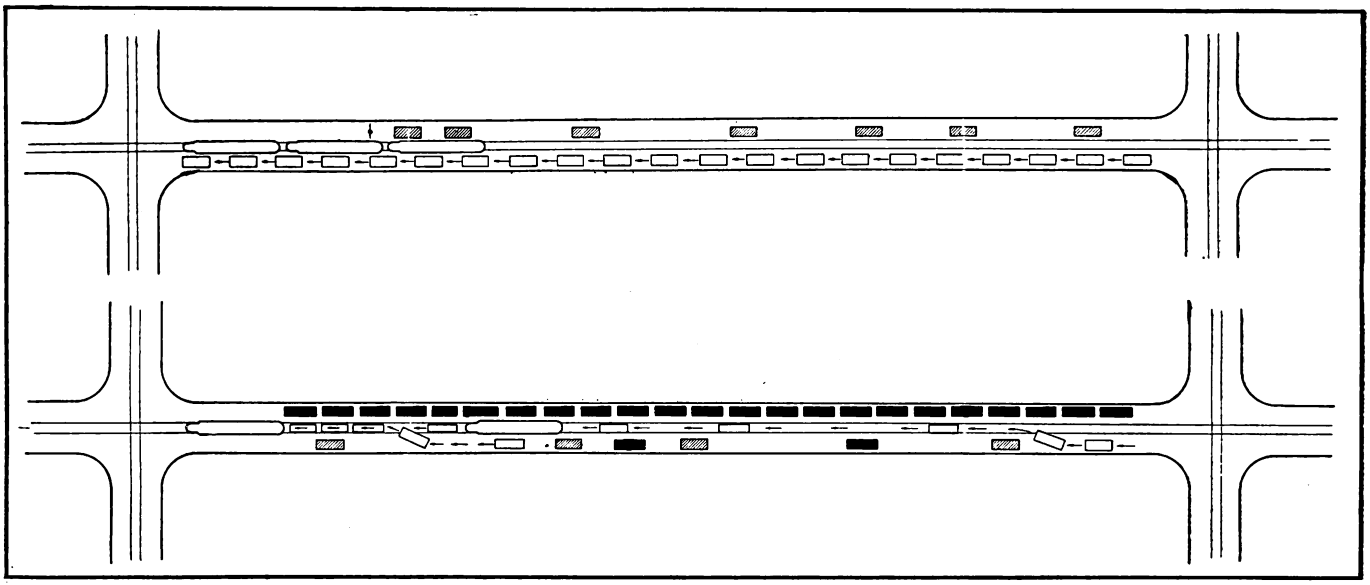
The new city administration realizes that the first step in any plan of improvement lies in using the existing street space to its greatest capacity. To this end a traffic division in the police department was recently created, under the leadership of General S. D. Butler, the director of public safety. How much can be done in obtaining proper use of the existing street capacity has been well illustrated by results from the revolutionary traffic regulations inaugurated on Chestnut and Walnut streets, running east and west through the entire 2-mile length of the business district. For a number of years these have been operated as one-way streets, but the number of parked automobiles and the indiscriminate use of the roadway have reduced its capacity, both for automotive vehicles and for street cars.

Butler's outstanding action has been to abolish automobile traffic on street car tracks of these two streets. Maintaining that automobilists have no right to block street cars by getting in the way, Butler has closed the car track space to them for a distance of forty blocks in the center of the city and has placed mounted policemen on duty to enforce his orders. He also has reserved a right-hand side space of 100 ft. back of each street crossing, where the street cars stop, for the exclusive use of street car passengers. When an automobilist enters the restricted area, he finds it well policed. If he gets on the car tracks a mounted officer orders him off immediately.

Abolishing parking on the left-hand side of these one-way streets has made it possible for automobiles to move in a continuous stream on the left-hand side of the street cars instead of being forced to operate on the car tracks as was previously the case. This has resulted in speeding up trolley service. The running time on a round trip through the congested area has been reduced from 40 minutes to approximately 33 minutes.

Safety experts from the Bureau of Safety, New York, who have visited Philadelphia say the establishment of 100-ft. safety zones at corners for street car passengers will work wonders in accident prevention. One of the large causes of accidents to street car passengers comes from automobiles rushing past cars which are being loaded or unloaded.

These zones permit the loading of three street cars at a time without interruption. Heretofore, with automobiles pulling past the cars as fast as one was loaded and pulled out, persons waiting in the street for other cars were forced to retreat to the curb, or dodge automobiles in the middle of the street. The effect of the new regulations can be seen from the diagram, which compares the present with former conditions.



How the New Regulations Have Improved Conditions on Walnut Street. Above, Present Arrangement; Below, Previous Arrangement

In addition to speeding up street cars and eliminating chances for accident General Butler has prohibited parking of automobiles on the two principal streets. Likewise he has begun to enforce parking ordinances long since dead.

Discussing the new plan, H. E. Ehlers, director of the department of city transit, said: "The consensus of opinion locally seems to be that the scheme has fully proved itself, particularly from the street railway viewpoint."

Director of Traffic G. W. Fritz is quoted as saying: "We are not trying to favor anybody or anything in this traffic rearrangement, but we are trying to work out, in a manner that will be of benefit to everybody, our most pressing traffic problems. The new Chestnut-Walnut Street plan has already shown it is a good thing. I traveled from Twenty-third Street to Third Street in Chestnut yesterday in six minutes."

# Improved Methods Produce Results in Kansas City

### Three Years Operation Under Receivership Shows Outstanding Advance in Efficiency—Annual Deficit of $1,500,000 Turned to a Net of Over Half Million—Satisfactory Relations Established with Employees and Public —Continuous Operating Budget Gives Close Control of Expenditures

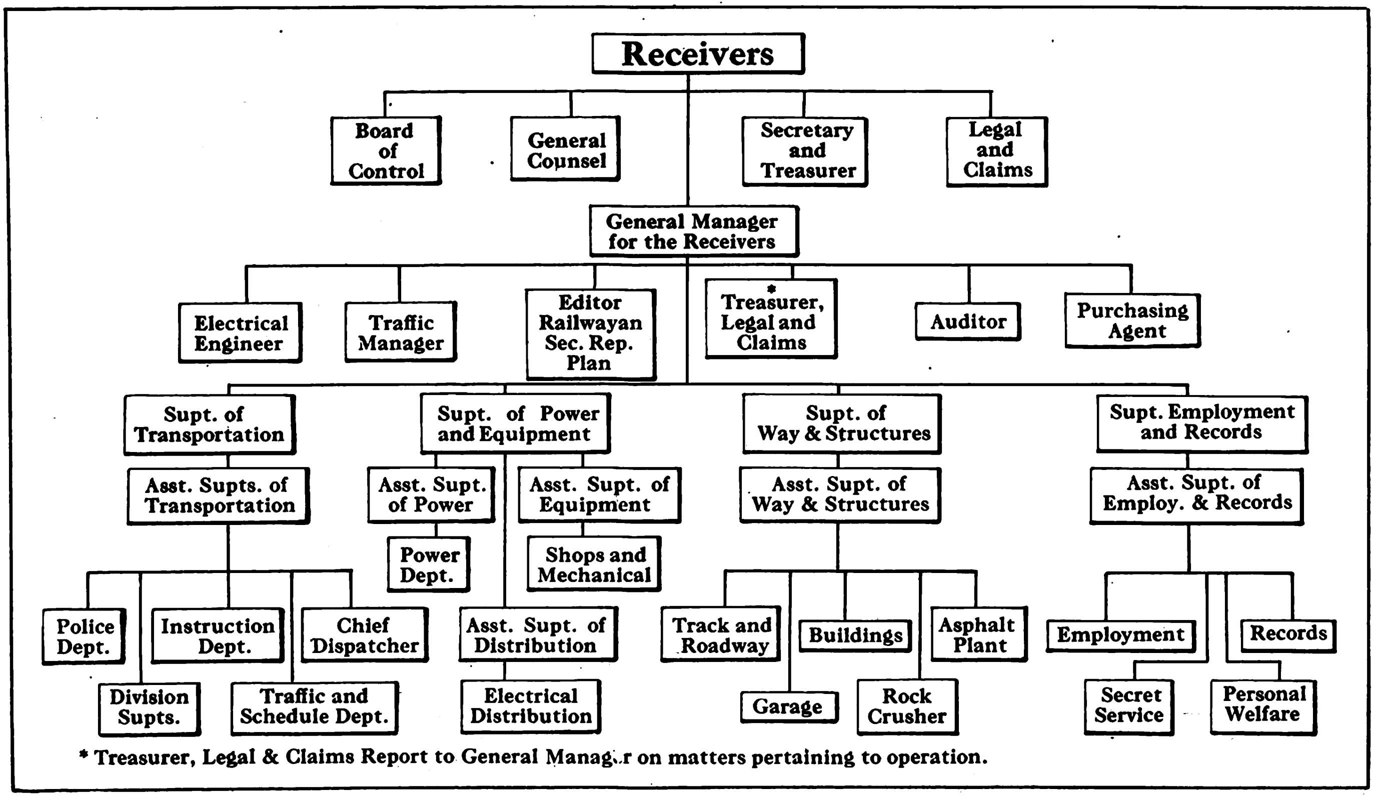
OPERATION of the Kansas City Railways under a receivership in which the interests of the riding public are given first consideration and in which modern management methods have been applied throughout the organization has resulted in so material an improvement in service and efficiency that widespread public support and co-operation have been won. Heavy grades and severe service characterize Kansas City conditions, but the results accomplished during the three years of the receivership clearly reflect the effectiveness of the methods adopted to put this property back into sound operating condition.

Since Sept. 9, 1920, when Col. Fred W. Fleming and former Senator Francis M. Wilson were named receivers by Judge Kimbrough Stone of the United States Circuit Court, the work of rehabilitation has gone steadily forward. F. G. Buffe has been general manager and operating head of the property since the latter part of 1919, when it emerged from a disastrous strike as a result of which 2,500 of its 3,000 employees were permanently cut off the payrolls. Just prior to the receivership, in the latter part of 1919 and the early part of 1920, the entire departmental organization had been completely revamped both in structure and personnel. To obtain an operating force of 1,800 to 2,000 trainmen more than 6,000 men were employed during that period, so heavy was the labor turnover. The transportation, shops, power house and distribution departments were completely overhauled and reorganized. The receivers approved this organization and the active work of rehabilitation went rapidly forward.

#### IMPROVED EMPLOYEE RELATIONS

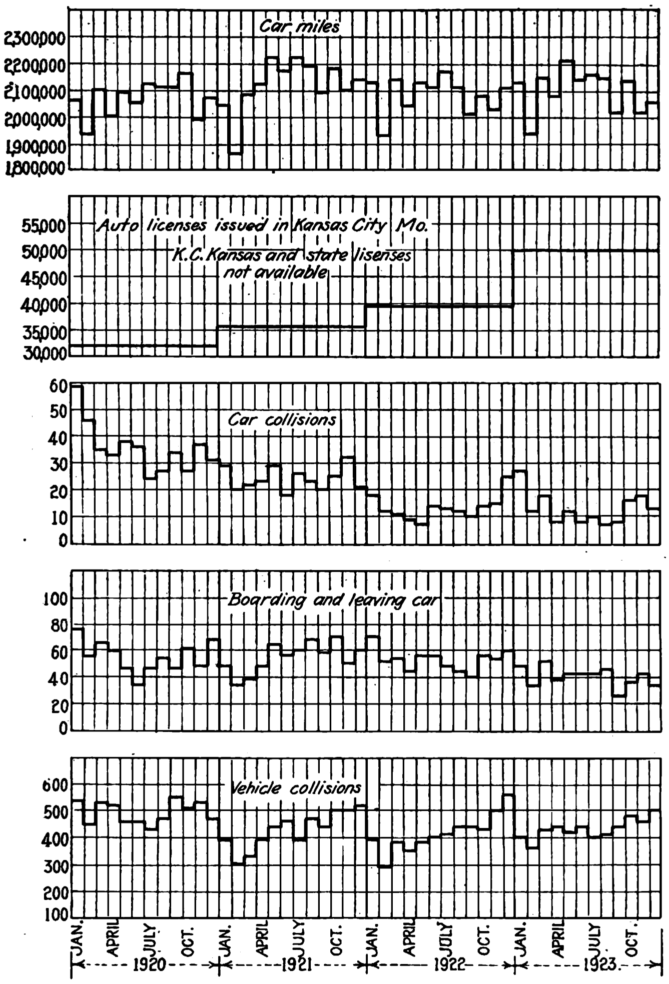
Labor difficulties have been eliminated by building up an employee brotherhood and representation plan. These improved relations have made possible the carrying out of an active program for improving public relations, one of the most important factors being the attitude on the part of trainmen in their contact with the public. Accompanying this has come a constantly increasing efficiency of all of the operating forces throughout the various departments. During 1920 a slight modification of a Beeler plan of routing was put into effect, and this produced an immediate improvement in the service. Some of the steps taken and results accomplished were described in the ELECTRIC RAILWAY JOURNAL of Sept. 24, 1921.

Severe jitney competition was eliminated by the im-


Receivers
Board of Control
General Counsel
Secretary and Treasurer
Legal and Claims
General Manager for the Receivers
Electrical Engineer
Traffic Manager
Editor Railwayan Sec. Rep. Plan
* Treasurer, Legal and Claims
Auditor
Purchasing Agent
Supt. of Transportation
Supt. of Power and Equipment
Supt. of Way & Structures
Supt. Employment and Records
Asst. Supts. of Transportation
Asst. Supt. of Power
Asst. Supt. of Equipment
Asst. Supt. of Way & Structures
Asst. Supt. of Employ. & Records
Power Dept.
Shops and Mechanical
Police Dept.
Instruction Dept.
Chief Dispatcher
Asst. Supt. of Distribution
Track and Roadway
Buildings
Asphalt Plant
Employment
Records
Division Supts.
Traffic and Schedule Dept.
Electrical Distribution
Garage
Rock Crusher
Secret Service
Personal Welfare

* Treasurer, Legal & Claims Report to General Manager on matters pertaining to operation.

Organization of the Kansas City Railways, Which Is Considered One of the Important Factors in the Record of Improvements Made



**Trend of Accidents in Comparison with Car-Miles Operated and Number of Automobiles Licensed in Kansas City, Mo.**

Vehicle collisions have been slightly reduced despite the big increase in number of automobiles, and car collisions and boarding and alighting accidents have decreased substantially.

provements in service and the consequent improved attitude of the public. This resulted in a steady growth in earnings, even though the number of private automobiles registered continued to increase rapidly. As an illustration of the increase in automobiles, registrations in Kansas City, Mo., and Kansas City, Kan., on Jan. 1, 1923, showed 64,300 cars, whereas on Jan. 1, 1924, this number was 83,600.

One factor, which in itself has been a great help in building up the property, is that the receivership has eliminated certain overhead and administration charges and saved approximately $100,000 per year. Furthermore, a wise investment of receivership funds has earned more than $235,000 in interest during the period of the receivership.

### INCOME INCREASED

Table I shows a comparison of income statements for the year ended Aug. 31, 1920, just prior to the receivership, with the year ended Aug. 31, 1923, under the receivership. The results accomplished are reflected by an increase in railway operating revenue from $9,198,981 to $10,428,293, which is accompanied by a decrease in operating expenses from $8,333,915 to $7,726,866. The former is attributable to improved public relations, better routing and the elimination of jitneys, while the latter is a direct result of increased efficiency in the operating departments. The statement

TABLE I—INCOME STATEMENT COMPARSION YEARS ENDING AUG. 31, 1923, AND AUG. 31, 1920

| | 1923 | 1920 |
|---|---|---|
| Total railway operating revenue | $10,428,293 | $9,198,981 |
| Total railway operating expense | 7,726,866 | 8,333,915 |
| Net revenue from railway operation | 2,701,426 | 865,066 |
| Net auxiliary revenue | 81,012 | 229,923 |
| Miscellaneous non-operating income | 146,821 | 36,359 |
| Total income | $2,929,261 | $1,131,349 |
| Taxes | 507,993 | 591,961 |
| Gross income | $2,421,267 | $539,388 |
| Interest and fixed charges | 1,905,364 | 2,034,083 |
| Net income | $515,902 | $1,494,695* |
| Increase in net | $2,010,597 | |

* Deficit.

TABLE II—OBLIGATIONS OF THE KANSAS CITY RAILWAYS AND THE RECEIVERS, THE CASH AND MATERIAL ACCOUNTS AND ADDITIONS TO PROPERTY SINCE RECEIVERSHIP

| | | |
|---|---|---|
| Indebtedness of the Kansas City Railways at date of receivership, Sept. 9, 1920: | | |
| Notes payable | $2,205,400 | |
| Vouchers payable, current accounts | 747,859 | |
| Payrolls | 324,556 | |
| Car trust notes | 317,507 | |
| Real estate mortgages | 23,250 | |
| Miscellaneous accounts payable | 50,998 | |
| Twenty-third Street viaduct | 143,930 | |
| Accrued taxes | 837,467 | |
| Wyandotte County bridge | 425,000 | |
| Fifteenth Street subway | 100,000 | |
| Injury and damage certificates | 126,297 | |
| 2,523 suits, amount sued for | 27,131,186 | |
| Judgments | 525,346 | |
| Claims in Federal court | 935,046 | |
| | | $33,893,842 |
| Indebtedness of the Kansas City Railways and receivers as of Sept. 30, 1923: | | |
| Judgments on old cases | $525,346<br>1,573,203 | |
| 189 cases pending against the Kansas City Railways, amount sued for | 2,357,289 | |
| Judgments on appeal | 197,032 | |
| 405 cases pending against receivers, amount sued for | 4,345,904 | |
| Claims pending in Federal court | 935,046 | |
| Notes payable | 2,205,400 | |
| Vouchers and accounts payable | 360,526 | |
| Payrolls | 166,253 | |
| Wyandotte County bridge | 476,034 | |
| Fifteenth Street subway | 100,000 | |
| Accrued taxes | 887,112 | 14,129,145 |
| Reduction in liabilities during receivership | | $19,764,697 |
| Cash and material account as of Sept. 9, 1920: | | |
| Accounts receivable | 500,475 | |
| Cash assets | 252,021 | |
| Materials | 833,426 | |
| | | 1,585,922 |
| Cash and materials as of Sept. 9, 1923: | | |
| Accounts receivable | 382,394 | |
| Cash and securities | 4,227,383 | |
| Materials | 848,364 | |
| | | 5,458,141 |
| Gain in cash assets during receivership | | 3,872,219 |
| Capital additions by receivers | | 1,893,361 |
| Increase in cash assets and property account under receivers | | $5,765,581 |

TABLE III—AMOUNTS EXPENDED BY RECEIVERS FOR ADDITIONS AND BETTERMENTS, INCLUDING EQUIPMENT, FROM DATE OF RECEIVERSHIP, SEPT. 9, 1920, TO AUG. 31, 1923

| | |
|---|---|
| Balance due on purchase of 95 safety cars | $304,371.67 |
| Purchase of 20 cars (double truck) | 275,348.79 |
| Purchase of 3 differential work cars | 28,710.69 |
| Replacing 50 old type compressors | 15,477.17 |
| Replacing destination signs and curtains on cars | 19,577.11 |
| Rebuilding cars 1105, 1116 and 1121 | 25,643.28 |
| Converting cars 1201 to 1211 to multiple-unit type | 33,915.31 |
| Installation of folding doors and steps on 110 cars | 30,247.05 |
| Replacing motors on 1500 type cars | 18,317.43 |
| Replacing motors at Tenth and Lister shops | 17,964.73 |
| Sprinkler system at Tenth and Lister shops | 8,924.80 |
| Cost of Twenty-third Street viaduct since receivership | 257,257.49 |
| Reconstruction of tracks on Eighth Street, McGee to Troost | 29,169.36 |
| Construction of loop at Twelfth and Jackson | 27,890.63 |
| Replacement of rail on Broadway, Fifth to Eleventh | 6,784.28 |
| Rebuilding track on Grand, Twelfth to Fifteenth | 29,559.22 |
| Rebuilding track on Thirty-first, Troost to Woodland | 48,406.97 |
| Rebuilding track on Eighth, Broadway to Wyandotte | 15,296.97 |
| Rebuilding track on Hemming and Kansas City Avenue | 4,482.23 |
| Track special work and O.H.B. Forty-eighth and Harrison | 16,705.82 |
| Track special work and O.H.B. Ninth and Brighton | 38,830.66 |
| Improvements in Armour Hills addition | 12,952.31 |
| Replacing rail on Dodson Line, Seventy-first to M.P. crossing | 8,520.06 |
| Rebuilding track on Lexington, Garfield to Montgall | 20,816.37 |
| Replacing rail on Walnut, Eighth to Twelfth | 16,513.14 |
| Rebuilding track on Twenty-fourth, S. W. Boulevard to Terrace | 12,430.50 |
| Curves and change of tracks, Forty-eighth and Prospect | 13,761.87 |
| Changing feeders and O.H.B. James and Central to State Line | 8,231.92 |
| Installation of extension to chain grate stokers at power house | 20,493.43 |
| Installation of ash car system at power house | 18,740.18 |
| Installation of skip hoist for ashes at power house | 24,695.90 |
| Installation of turbine at power house | 4,737.86 |
| Building addition to trainmen's building, Forty-eighth and Harrison | 31,232.90 |
| Miscellaneous items of additions and improvements of less than $10,000 each | 447,353.49 |
| Total | $1,893,361.59 |

TABLE IV—COMPARATIVE STATEMENT OF ACTUAL INCOME AND EXPENSES FOR YEAR 1923 AS COMPARED WITH BUDGET ESTIMATE AND ACTUAL FOR YEAR 1922.

| | Actual 1922 | Budget 1923 | Actual 1923 |
|---|---|---|---|
| Passenger revenue | $10,213,928.12 | $10,320,000.00 | $10,139,878.91 |
| Freight and other transportation revenue | 68,191.03 | 77,500.00 | 67,521.72 |
| Revenue other than transportation | 122,625.71 | 122,000.00 | 97,008.21 |
| Total railway operating revenue | $10,404,744.86 | $10,519,500.00 | $10,304,408.84 |
| Maintenance and operation: | | | |
| Way and structures | 768,964.58 | 840,000.00 | 867,675.24 |
| Equipment | 1,053,751.29 | 955,498.00 | 934,623.60 |
| Power | 1,323,891.86 | 1,175,586.00 | 1,144,753.93 |
| Conducting transportation | 3,551,130.61 | 3,557,026.73 | 3,554,353.04 |
| Traffic | 10,090.36 | 9,200.00 | 8,264.12 |
| General and miscellaneous | 637,907.16 | 635,227.91 | 607,379.92 |
| Injuries and damages | 720,000.00 | 720,000.00 | 720,000.00 |
| Total railway operating expenses | $8,065,735.86 | $7,892,539.32 | $7,837,049.85 |
| Net revenue from railway operation | 2,339,009.00 | 2,626,960.68 | 2,467,358.99 |
| Net auxiliary revenue | 111,702.35 | 86,500.00 | 85,263.80 |
| Miscellaneous non-operating income | 113,407.99 | 152,000.00 | 173,997.46 |
| Total income | $2,564,119.34 | $2,865,460.68 | $2,726,620.25 |
| Taxes | 533,593.57 | 516,000.00 | 474,378.01 |
| Gross income | $2,030,525.77 | $2,349,460.68 | $2,252,242.24 |
| Deductions from income | 1,909,030.74 | 1,905,650.00 | 1,900,126.43 |
| Net income | $121,495.03 | $443,810.68 | $352,115.81 |

shows a net income of $515,902 for the year 1923, as compared with a deficit of $1,494,695 for the year 1920.

Table II shows what has been accomplished in reducing the outstanding obligations, in building up cash assets, materials and property accounts since the receivership. Comparing the obligations on Sept. 9, 1920, the date of the receivership, with those of Sept. 30, 1923, shows a reduction of $19,764,697 for the period. During the same time the sum of accounts receivable, cash assets and materials on hand has been increased by $3,872,219. In addition, capital additions and improvements amounting to $1,893,361 have been made. The principal items included in these additions and betterments are listed in Table III, which, as will be noted, includes the purchase of 20 new double-truck cars that were described in the ELECTRIC RAILWAY JOURNAL for March 10, 1923, with operating features, Dec. 8, 1923.

### CONTINUOUS OPERATING BUDGET HELPFUL

Since 1919 each department has been operated under a continuous budget plan. These departmental budgets are made up by detailed accounts and are prepared six months in advance of the requirements. The individual departmental budgets are compiled by the department heads and their assistants and are then co-ordinated in the auditing department. At general staff meetings the necessary revisions and corrections are made and the budgets are then approved.

Each department head is furnished monthly a statement showing expenditures for the month by accounts, together with the budget allowances. The expenditures for the corresponding month of the previous year, together with the total expenditure by accounts prepared cumulatively for the current fiscal year to date at each monthly report, are also included.

A typical illustration of the results accomplished by this plan is given in Table IV. This shows the combined budgets for operating income and expense for the year 1923, which gave an estimated net income for that year of $443,810.68, in comparison with an actual net income of $352,115.81. Table V is a sample of the monthly reports furnished the heads of departments to show comparisons between detailed budget estimates and actual expenditures. This statement shows the report for November, 1923, for the transportation department, and it will be noted that the estimated expenditures from Jan. 1 to Nov. 30 for that year were $3,257,287.13, whereas the actual expenditures were within $4,824 of this amount. The care with which

TABLE V—COMPARISON OF BUDGET ALLOWANCES AND ACTUAL EXPENDITURES FOR CONDUCTING TRANSPORTATION

| Account | Item | Actual, November, 1922 | Budget, November, 1923 | Actual, November, 1923 | Actual, Jan. 1 to Nov. 30, 1922 | Budget, Jan. 1 to Nov. 30, 1923 | Actual Jan. 1 to Nov. 30, 1923 |
|---|---|---|---|---|---|---|---|
| 63 | Superintendent of transportation | $28,346.29 | $29,500.00 | $28,317.05 | $330,212.23 | $325,755.95 | $316,692.03 |
| 63B | Superintendent Transportation Board of Control | | | | | | |
| 64 | Passengers, conductors, motormen and trainmen | 219,603.72 | 218,900.00 | 218,646.49 | 2,453,134.18 | 2,466,790.00 | 2,482,697.12 |
| 641 | Students' time | 1,259.30 | 1,200.00 | 2,058.55 | 12,710.13 | 12,516.00 | 17,293.58 |
| 642 | Extra men's guarantee | 289.67 | 441.00 | 157.11 | 5,132.90 | 5,177.10 | 3,531.82 |
| 65 | Freight and express conductors, motormen and trainmen | 808.63 | 746.00 | 1,136.15 | 7,883.53 | 8,388.40 | 9,649.26 |
| 66 | Miscellaneous car service employees | 5,339.39 | 4,275.00 | 4,115.72 | 45,331.43 | 47,880.00 | 50,417.14 |
| 6711 | Batteries for electric bells, buzzers | 276.22 | 421.00 | 79.17 | 4,542.22 | 4,293.66 | 3,542.55 |
| 6712 | Car lighting | 1,107.74 | 1,098.00 | 989.26 | 13,701.30 | 12,682.34 | 10,370.23 |
| 6713 | Cord | 147.42 | 162.00 | 183.42 | 1,801.44 | 1,762.58 | 2,041.70 |
| 6714 | Waste for motors | 382.05 | 464.00 | 480.07 | 1,879.89 | 3,539.07 | 6,080.45 |
| 6715 | Waste for trucks | | 43.00 | 30.65 | 144.01 | 299.45 | 647.21 |
| 6716 | Gear grease | 157.74 | 108.00 | 117.91 | 310.80 | 921.24 | 1,186.47 |
| 6717 | Gear lubricants | 492.66 | 433.00 | 306.36 | 1,389.60 | 3,846.86 | 5,022.14 |
| 6718 | Compressor oil | 127.54 | 115.00 | 100.80 | 499.31 | 1,174.06 | 1,165.42 |
| 6719 | Motormen's tools | 6.48 | 9.00 | 10.07 | 158.68 | 88.44 | 111.57 |
| 6720 | Car cleaners' supplies | 243.49 | 304.00 | 352.55 | 3,909.23 | 3,343.71 | 3,851.79 |
| 6725 | Miscellaneous | 4,619.26 | 6,750.00 | 6,406.81 | 60,636.31 | 68,535.00 | 72,109.78 |
| 6726 | Coasters | 15.64 | 36.00 | 55.20 | 620.19 | 470.79 | 508.96 |
| 6727 | Fare boxes—parts | 77.64 | | | 390.62 | 333.04 | 6.39 |
| 6728 | Tools and other express freight car | | | | 10.86 | 57.92 | .28 |
| 68 | Station employees | 139.32 | 510.00 | 11.00 | 5,232.78 | 6,221.00 | 3,722.50 |
| 69 | Station expenses | 232.37 | 270.00 | 51.69 | 3,128.69 | 3,069.75 | 1,283.47 |
| 7011 | Foremen, motor and brake inspection | 2,652.74 | 2,896.00 | 3,483.62 | 30,686.19 | 29,619.05 | 33,443.77 |
| 7012 | Car placers and shifters | 3,924.48 | 4,200.00 | 3,574.80 | 47,632.42 | 47,040.00 | 41,489.35 |
| 7013 | Miscellaneous | 3,537.27 | 3,021.00 | 3,771.19 | 33,307.26 | 32,478.00 | 38,067.45 |
| 7014 | Issue clerks | 1,154.50 | 1,154.00 | 1,157.49 | 12,233.45 | 12,968.34 | 12,647.59 |
| 7015 | Car oilers | 1,583.60 | 1,613.00 | 1,619.29 | 17,791.12 | 17,852.82 | 19,185.13 |
| 7021 | Car washing | 874.20 | 895.00 | 464.06 | 12,327.57 | 9,808.57 | 7,899.85 |
| 7022 | Window washing | 1,706.57 | 1,688.00 | 1,143.67 | 19,007.77 | 19,156.68 | 17,999.94 |
| 7023 | Car sweeping | 3,819.45 | 3,902.00 | 3,665.04 | 42,555.14 | 43,068.00 | 42,707.37 |
| 7024 | Truck washing | | | | 1,264.47 | 762.01 | |
| 71 | Carhouse expenses | 1,652.54 | 990.00 | 1,298.68 | 11,049.79 | 11,088.00 | 12,661.51 |
| 72 | Operation of signal and interlocking apparatus | 245.67 | 255.00 | | 2,499.57 | 2,874.30 | 2,041.53 |
| 73 | Operation of telegraph and telegraph lines | 1,206.73 | 1,200.00 | 1,234.11 | 13,232.01 | 13,440.00 | 13,864.01 |
| 76 | Freight and express collection and delivery | | | | | | 444.23 |
| 77 | Loss and damages | | 5.00 | 1.00 | | 55.00 | 21.77 |
| 78 | Other transportation expenses | 1,880.28 | 3,000.00 | 2,056.96 | 50,055.74 | 39,930.00 | 27,705.90 |
| | Total | $287,910.60 | $290,604.00 | $287,075.94 | $3,246,402.83 | $3,257,287.13 | $3,262,111.26 |

these budgets are prepared is also illustrated by the comparatively close agreement between the estimated and actual figures for the various detailed items making up this statement.

Construction budgets for capital expenditures are made up at the beginning of each year to cover contemplated construction work by each department for a twelve-month period, in order to allow the various departments to plan their work a sufficient time in advance and to distribute the expenditures through the year. Monthly cumulative reports similar to those compiled for the operating accounts are furnished to each department head to cover capital expenditures. A combination of the operating and construction budgets enables the management to prepare a cash budget at the beginning of each year.

### EMPLOYEES CAREFULLY SELECTED

Under the supervision of a superintendent of employment and records, the selection, examination and training of employees has been given very specific attention. This department handles employees' records for all departments and also looks after the secret service work of the company. Applicants for employment are required to submit to a full physical examination, which is equivalent to that required by insurance companies. This practice has resulted in the elimination of many undesirables. In the employment of new men the company has worked on the principle that it is under no obligation to an applicant and that money spent in the careful selection of new employees is a very profitable investment. Once a man is put on the payroll, physical or moral defects become a decided liability. They decrease the man's efficiency, increase accidents, cause irregularity in reporting for work, and in many other ways lower the quality of performance of the operating force. Direct results in the form of reduction in absentees and labor turnover have followed the adoption of these more rigid employment practices.

### MINIMUM WAGE GUARANTEE ATTRACTIVE

Every extra man is guaranteed a minimum wage of $110 per month providing he makes all "show ups" during the month. By careful scheduling, the average total amount paid out under this agreement to more than 2,000 trainmen in the seven divisions is kept down to less than $160 per month in excess of the actual amount earned. The moral effect of the arrangement on employees and its effect in attracting a desirable class of men to apply for employment are believed to exceed very much the small cost of this arrangement.

Increased efficiency in all of the departments, improved scheduling of runs and careful attention to labor-saving methods have resulted in large savings in annual labor expenditures. As an example of the economies effected, Table VI shows a decrease in the annual payroll of $558,106 for 1923 in comparison with 1920. In this comparison the first five months of 1920 are adjusted to the same rate of pay that became effective subsequent to June of that year. On this basis, the reduction amounts to approximately 9.3 per cent in total annual labor costs. The better efficiency is well illustrated by the reduction in the total number of employees form 4,089 to 3,400 between 1920 and 1923, while at the same time the number of cars in service in the peak hour increased from 640 to 694.

### LABOR TURNOVER REDUCED

Table VII shows the labor turnover in the transportation department from 1920 through 1923 by years. This was reduced from 81.7 per cent in 1920 to 30.2 per cent in 1923. Another index of the improvement in the performance of transportation employees is furnished by the result of inspections of fare irregularities. During the period from 1921 to 1923 the inspection force itself has been slowly built up with a constantly increasing degree of efficiency, so that the percentage of in-

TABLE VI—TOTAL PAYROLL COMPARISON, KANSAS CITY RAILWAYS

| | 1920 | 1923 | Decrease |
|---|---|---|---|
| January | $466,030 | $458,379 | |
| February | 422,758 | 411,380 | |
| March | 461,580 | 450,742 | |
| April | 461,211 | 446,537 | |
| May | 469,510 | 469,045 | |
| June | 496,510* | 468,730 | |
| July | 511,305 | 474,429 | |
| August | 503,876 | 468,729 | |
| September | 492,396 | 440,370 | |
| October | 499,073 | 469,796 | |
| November | 464,632 | 443,401 | |
| December | 477,794 | 440,761 | |
| | $5,726,675 | $5,442,299 | $284,376 |
| Payroll addition if first five months were at same rate as present | 273,730 | | |
| | $6,000,405 | $5,442,299 | $558,106 |
| Reduction in annual payroll | | 9.3% or | 558,106 |
| Average number employees | 4,089 | 3,400 | |
| Cars in service, maximum hour | 640 | 694 | |

* 12 per cent wage increase June, 1920

TABLE VII—TURNOVER OF TRAINMEN

| | In Service Jan. 1 | Left Service During Year | Turnover | Turnover of Men in Service Less Than One Year | Turnover of Men in Service More Than One Year |
|---|---|---|---|---|---|
| 1920 | 2,119 | 1,732 | 81.7% | 76.1% | 5.6% |
| 1921 | 1,843 | 755 | 41.0% | 28.7% | 12.3% |
| 1922 | 1,934 | 580 | 30.3% | 15.5% | 14.8% |
| 1923 | 1,831 | 563 | 30.2% | 15.7% | 14.3% |
| 1924 | 1,843 | | | | |

| | |
|---|---|
| Total turnover 1923 | 30.2 per cent |
| Discharged | 10.4 per cent |
| Voluntary | 19.7 per cent |

TABLE VIII—COMPARISON OF EQUIPMENT AND MECHANICAL DEPARTMENT EXPENSES AND WORK FOR YEARS ENDING DEC. 31, 1920 AND 1923.

| | 1920 | 1923 |
|---|---|---|
| Number car-miles operated | 24,808,411 | 25,399,290 |
| Total equipment cost per car-mile | $0.0499 | $0.0371 |
| Total equipment expenditure | $1,103,715 | $943,795 |
| Total cars through shops: | | |
| Wrecks | 141 | 183 |
| Repairs | 177 | 340 |
| New doors and steps | .... | 159 |
| Utility work | 4 | 21 |
| Overhaul | 300 | 389 |
| Repaint | 100 | 236 |
| Total | 805 | 1,258 |
| Pull-ins, year | 24,120 | 13,814 |
| Pull-ins, average per mo. | 2,010 | 1,151 |
| Pull-ins per 1,000 car-miles | 0.97 | 0.54 |
| Dead cars at divisions afternoon rush, per day | 22.3 | 2.3 |
| Mechanical labor at divisions | $340,164 | $169,154 |

TABLE IX—POWER COSTS DATA, KANSAS CITY RAILWAYS

| | 1920 | 1921 | 1922 | 1923 |
|---|---|---|---|---|
| Net kilowatt-hour output | 189,172,898 | 129,804,772 | 123,830,190 | 128,302,450 |
| Total cost, dollars | 2,928,221 | 1,735,840 | 1,399,126 | 1,197,928 |
| Total cost, mills per killowatt-hour | 15.469 | 13.373 | 11.299 | 9.336 |
| Cost fuel, mills per kilowatt-hour | 11.723 | 9.379 | 8.138 | 6.593 |
| Other cost, mills per kilowatt-hour | 3.746 | 3.994 | 3.161 | 2.743 |
| Tons coal burned | 401,531 | 244,215 | 161,027 | 198,200 |
| Barrels oil burned | 98,109 | 57,286 | 190,589 | 52,225 |
| Total coal equivalent, tons | 432,435 | 262,260 | 221,062 | 214,650 |
| Pounds coal equivalent per kilowatt-hour | 4.57184 | 4.04083 | 3.57040 | 3.34600 |
| Total cost fuel only, dollars | 2,146,470 | 1,192,543 | 990,994 | 834,094 |
| Average cost fuel per ton, dollars | 4.9636 | 4.5472 | 4.4828 | 3.8858 |
| Tons coal required, basis 1920 consumption. | .......... | 296,723 | 283,066 | 293,289 |
| Saving in coal due to increased economies, tons. | .......... | 34,463 | 62,004 | 78,639 |
| Saving in dollars | .......... | 156,710.15 | 277,951.53 | 305,575.43 |
| Saving other items over 1920, dollars | .......... | *32,191.58 | 72,440.66 | 128,687.35 |
| Total saving per year over 1920 operation, exclusive of saving due to decrease in market price of fuel, dollars | .......... | 124,518.57 | 350,392.19 | 434,262.78 |

* Increase.

spections developing fare collection irregularities should have shown an increase if there had been no corresponding improvement in the character of trainmen. In a fifteen-day period more than 5,000 different inspections are made of a given number of conductors, selected at random, so that a fair cross-section of the entire platform personnel is obtained. The figures below show the reduction in the average percentage of total inspections developing irregularities each year from 1921 to 1923:

PERCENTAGE OF INSPECTIONS DEVELOPING IRREGULARITIES IN FARE COLLECTION

| | |
|---|---|
| January, 1921 | 4.8 per cent |
| 12 months of 1921 | 2.2 per cent |
| 12 months of 1922 | 1.3 per cent |
| 12 months of 1923 | 0.9 per cent |

Corresponding improvement in performance is shown by Table VIII, which reflects what has been done in the equipment and mechanical department. The comparison between the years 1923 and 1920 on this statement shows an increase of 590,889 in the number of car-miles operated, but a reduction in total equipment expenditures of $159,920, or a change in the total equipment maintenance cost from 4.99 cents to 3.71 cents per car-mile, a saving of 1.28 cents per car-mile. At the same time there is a large increase in the number of cars put through the shop for repairs, overhaul and repainting and there is included in the 1923 figure the cost of putting 159 cars through for remodeling doors and steps.

Mechanical labor at the division carhouses was reduced from $340,164 in 1920 to $169,154 in 1923. Along with this reduction in carhouse labor, the pull-ins for all causes were reduced from 24,120 in 1920 to 13,814 in 1923. In these figures, any car which is taken out of service for any reason whatever before having completed its scheduled run is classed as a "pull-in."

Power house operation, which, together with equipment maintenance, is carried out under the general supervision of the superintendent of power and equipment, has likewise shown substantial progressive reductions in costs from 1920 to 1923, as shown in Table IX. Some of the steps taken to improve performance and increase efficiency were described in the ELECTRIC RAILWAY JOURNAL of March 17, 1923. The total cost of power per kilowatt-hour was decreased from 15.469 mills in 1920 to 9.336 mills in 1923. Direct saving in fuel, on the basis of 1920 consumption, amounted to 78,639 tons. The total saving per year in the power department over 1920 operation, exclusive of the saving due to decreased market price of fuel, amounted to $434,262.78.

The severe grades encountered in Kansas City present a serious accident hazard. Every effort has been made to reduce accidents to a minimum. The chart on page 808 gives the record for the years 1920-1923, inclusive, of the monthly figures for car-miles operated, car collisions, boarding and alighting accidents and vehicle collisions. The number of automobile licenses issued in Kansas City, Mo., for each year are also shown in the chart. Each department has been thoroughly drilled in accident prevention work and the company also cooperates in the city accident prevention activities. Although the large increase in the number of automobiles operated in the city has presented a constantly growing problem from the standpoint of vehicular collisions, car collisions and boarding and alighting accidents have been materially reduced in number.

# Rochester Bus Accounts

## Rochester Railways Drafts Classification for Gas and Trackless Trolleys, Based on New York State Schedules

THE use of both trackless trolleys and gas buses in Rochester has compelled the adoption of some kind of classification of operating expense accounts suitable to both kinds of motive power. Both classes of buses are conducted under the name of Rochester Railways Co-ordinated Bus Lines, Inc., and the classification of accounts adopted has been drafted by the auditors of the Rochester Railways on the basis of the classification of electric railway accounts of the New York State Public Service Commission. This state standard is based on the Interstate Commerce Commission classification, but there are some additional accounts. The new classification is published below.

The account numbers are not consecutive, but are the same as the corresponding or most nearly corresponding account in the Public Service Commission electric railway classification. Where the corresponding railway account has been divided in the bus account, the letters A, B, etc., are used to designate divided accounts, such as (30A) bodies and chassis, (30B) tires, (67A) miscellaneous bus service expenses, (67B) lubricants. The other letters used are "G" for gas buses and "T" for trackless trolley buses.

ROCHESTER RAILWAYS CO-ORDINATED BUS LINES, INC.

WAY AND STRUCTURES

1. Superintendence.
9. Misc. Roadway Expenses.
10. Paving.
11. Sanding Roadway.
12. Removal of Snow and Other Obstructions.
19. Misc. Way Expenses.
20. Distribution Poles and Fixtures.
22. Distribution System.
23. Misc. Dist. System Expenses.
24. Repairs Buildings, Fixtures and Grounds.
25. Depreciation of Buildings and Fixtures.
28. Equalization — Way and Structures.

EQUIPMENT

29. Superintendence of Equipment.
30–A Repairs of Bodies and Chassis.
30–B Repairs of Tires.
32. Service Equipment.
33–G Repairs of Engines.
33–T Repairs of Electric Equipment.
36. Shop Equipment.
37. Shop Expenses.
39. Misc. Equip. Expenses.
40. Depreciation of Equipment.
44. Equalization—Equipment.

POWER

45. Superintendence Power.
48. Substation Equipment.
49–A Trans. Poles and Fixtures.
49–B Trans. Underground Conduits.
49–C Transmission System.
50–A Depre. Power Plant Bldgs. and Equipment.
51. Equalization—Power.
56–B Station Expenses.
57. Substation Employees.
58. Substation Supplies and Expenses.
59–B Fuel for Power.
59–C Elec. Energy from Other Sources.

CONDUCTING TRANSPORTATION

63. Superintendence of Transportation.
64–G Auto-Bus Operation.
64–T Trolley-Bus Operation.
66. Misc. Bus Service Employees.
67–A Misc. Bus Service Expenses.
67–B Lubricants.
68. Station Employees.
69. Station Expenses.
70. Garage Employees.
78. Other Transp. Expenses.

TRAFFIC

79. Superintendence and Solicitation.
80. Advertising.
82. Misc. Traffic Expenses.

GENERAL AND MISCELLANEOUS

83. Sals. and Expense of Gen. Officers.
84. Sals. and Expenses of Gen. Office Clerks.
81. Gen. Office Supplies and Expenses.
86. Law Expenses.
89–A Licenses.
89–B Misc. General Expenses.
92–A Injuries and Damages.
92–B Law Exp's connected with Damages.
93. Insurance.
94. Stationery and Printing.

The physical life assumed for various parts of equipment in these accounts is as follows:

| | |
|---|---|
| Street signals | 5 years |
| Poles and fixtures | 20 years |
| Electrical distribution systems | 8 years |
| Shop buildings | 35 years |
| Trolley buses | 18 years |
| Gas buses | 10 years |

In addition the company has a short section of street paving in a loop over private property. The life of this paving is estimated at twenty years.

# Test of 3,000-Volt Train

### High-Voltage D.C. Multiple Unit Train Developed at Erie—There Are Four Motors on the Car, Designed to Run Full Series or Series-Parallel

ON MAY 19, on invitation of the General Electric Company, a number of engineers from the steam railroads in the country, consulting engineers and representatives of the technical press gathered at Erie, Pa., to inspect a 3,000-volt car with multiple-unit control and witness locomotive tests. A train was made of a motor car with parlor, baggage, smoking and main passenger compartments and a trail car. The motor car was purchased from the Michigan Railway. The equipment consists of four GE-280 1,500-3,000-volt railway motors with type PC control and low-voltage lighting.

The motors mechanically are practically the same as the 1,500-volt motors recently built for the Paris-Orleans Railway, except that insulation has been added to take care of the higher trolley voltage. They are coupled permanently two in series so as to give two economical running speeds, full series and series parallel. The gear reduction is 70/21, giving a ratio of 3.33 and a maximum emergency operating speed with 36-in. wheels of 60 m.p.h. The motor capacity is sufficient to handle without overheating a 40-ton trailing coach, and at a somewhat reduced schedule two trailers.

The control is designated as PC-104 electro-pneumatic type and consists of a cam-operated switch group. In general the design is similar to the 1,500-volt control used for the Paris-Orleans motor cars with provision for higher voltage. The low voltage for control and lighting is obtained from a small 65-volt generator, having the armature carried on the shaft extension of a 1,500-3,000-volt dynamotor. The dynamotor winding is used to operate the CP-30 air compressor at 1,500 volts. A 28-cell storage battery is floated across the 65-volt generator control for operation when the set is shut down.

A feature of the control is a line breaker consisting of high-speed contactors connected in series for interrupting the 3,000-volt circuit. When the master controller is thrown to the off position, the motor current is broken by the line breaker, which reduces the duty on the other equipment. The control is arranged for seven stops full series and six steps series-parallel, including the tapped-field connection on the last step.

The heater equipment consists of a 30-kw. and a 10-kw. grid, taking current from the 3,000-volt bus line with suitable control. These heating elements are inclosed in an insulated box underneath the car. The hot air is carried to various parts of the car through a duct by a motor-driven blower. Similar equipment will also be installed for heating the trail coach.

The connection between the 3,000-volt heater bus on the motor car and the trailer is made by a simple device called the type SZ-14-A coupler. A swinging arm with insulating support resembling a miniature trolley and base is mounted on each car, and the connection is made by placing the arm of one car under a hook on the other. The coupler is manipulated from the ground by a switch hook.

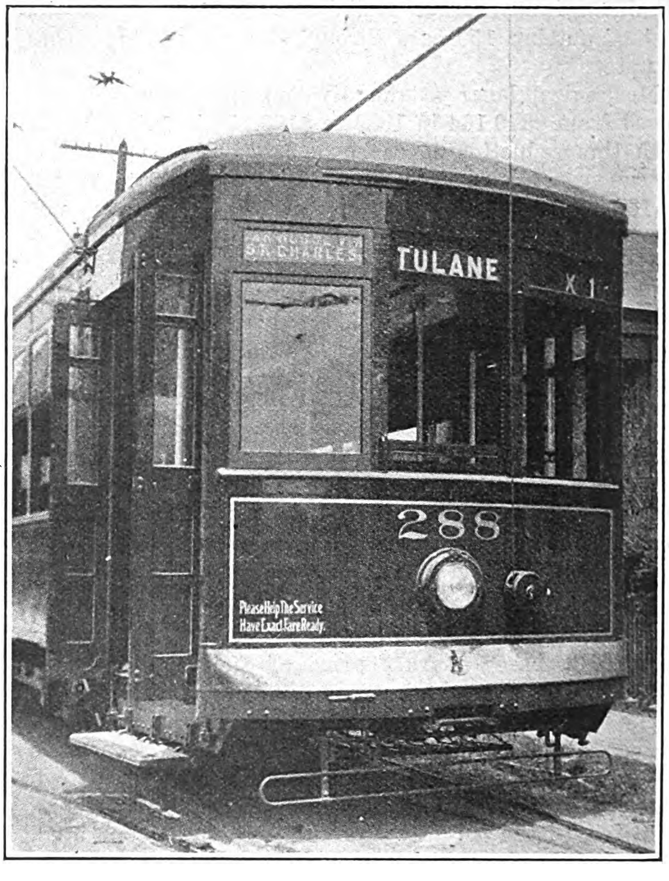
Current is collected from the overhead trolley by a single type S-501 slider pantograph similar to that used on 3,000-volt locomotives, carried on the motor car.

In addition to the test train one of the C., M. & St. P. Railway gearless locomotives was on exhibition. This locomotive has been in use for four years and has run 450,000 miles without the commutator being turned. Ten of the 3,000-volt 12-wheel locomotives being built by the General Electric Company for the Mexican Railways were also inspected.

# Roll Signs Indicate Run Numbers

A NEW method of displaying the run numbers on the front of cars in service has been adopted by the New Orleans Public Service, Inc. Over the right-hand front dash window of each car has been placed a Keystone roll sign. This device consists of four vertical rollers, and a sign roll between each pair of rollers. The signs carry figures and letters so arranged that any number from 1 to 99 can be displayed, or, if it is desired, a key letter, such as "X," denoting extra, can be substituted for the first digit. The material of the sign is translucent cloth, black with white lettering, so that an electric light placed behind it illuminates the run number at night. A three-sided box, with its open face against the window glass, surrounds the apparatus.

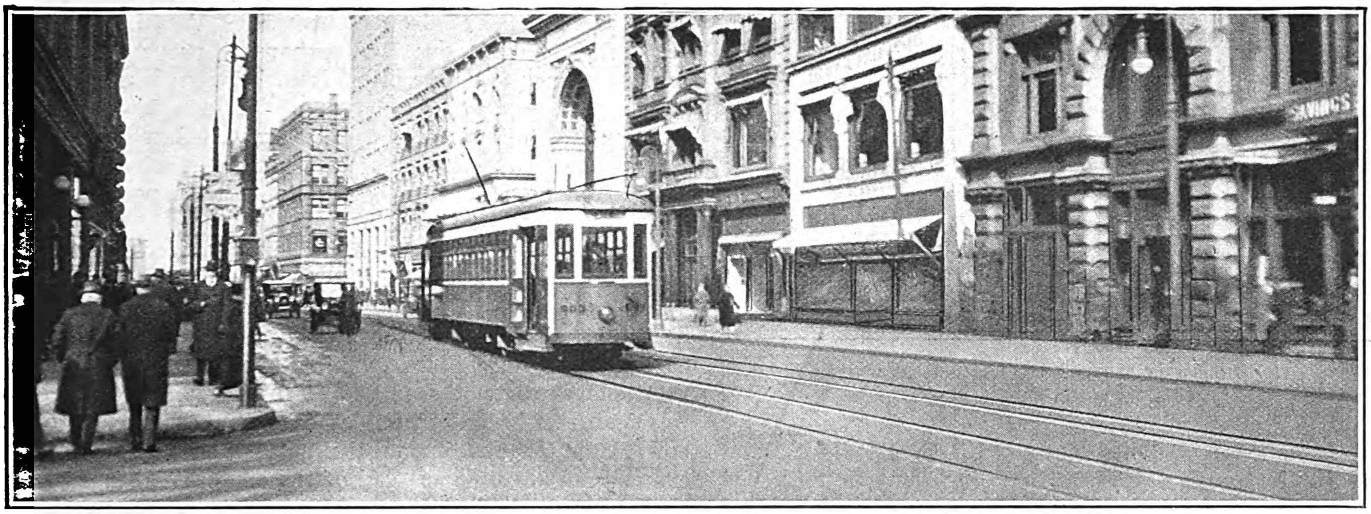
Many of the cars operated by the New Orleans Public Service, Inc., have already been equipped with these roll sings, and it is planned to continue the installation on other cars. This method of displaying the run number has proved advantageous not only because the illumination makes it easier at night for checkers to read the figures, but also because, being more or less permanently attached to the car, it cannot be lost, as happens so often with the ordinary metal run number.



The Run Number of This New Orleans Car is Indicated by the Roll Sign Over the Right-Hand Dash Window

# Rugged Cars Handle Large Crowds

## Heavy Traffic in the Afternoon Rush Hour and Severe Winter Weather Conditions Were Influential Factors in the Design of a New Car for the Springfield Street Railway—An Unusual Type Truck Is Used



New Car Designed by Springfield Street Railway Specially to Handle Heavy Traffic on Main Street

AFTER giving careful consideration to the particular operating conditions existing in Springfield, Mass., the Springfield Street Railway has designed a new car equipped with many modern devices, yet differing in several important respects from prevalent tendencies of car design. The sharp traffic peak in the afternoon rush hour and the impossibility of operating a short headway on the line where it was planned to place these cars in service dictated that the new vehicles should have a large carrying capacity. And the trying experiences with heavy snows and ice during previous winters convinced the management that the cars should be rugged and powerful.

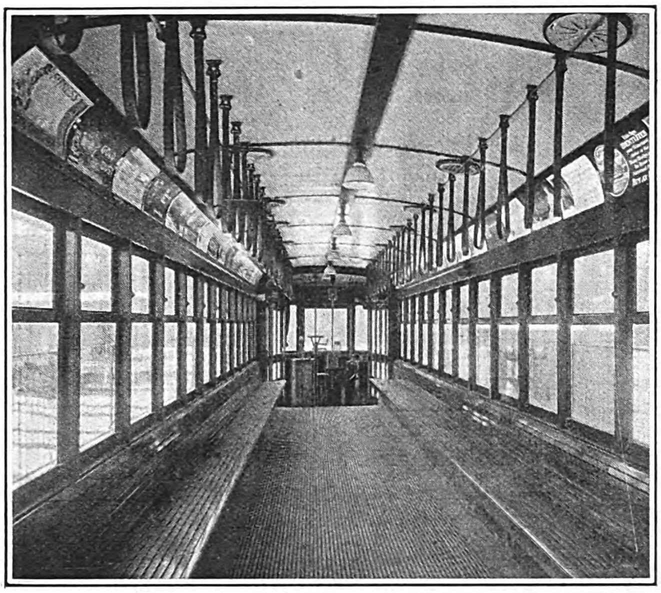
Practically every car line in Springfield follows Main Street for part of its route. In the late afternoon large numbers of waiting people assemble there at the various trolley stops. When buying new rolling stock, therefore, the railway was desirous of securing cars that could carry away the crowds as fast as they gathered. This the company considered had to be done by increasing the size of the unit rather than by the operation of a greater number of units, because one of the two heavy lines where the cars run has a single-track section that prevents the operation of a short headway. The new type car has a seating capacity of 56 and a rush hour carrying capacity of about 180 passengers.

Peculiar weather conditions prevail in that part of the Connecticut Valley in winter. There are frequent heavy falls of snow, the total for the season of 1922-1923 being 106 in. At one time the snow lay 28 in. deep on the level ground. On the other hand the snow often turns to rain and makes heavy slush in the streets. At night this slush freezes and becomes a serious obstacle to railway operation. To overcome this difficulty the new cars are equipped with 31-in. steel wheels and four 65-hp. motors per car. The motors are Westinghouse No. 532-A.

Each detail of design has been studied and only those devices which are thought by the railway to be well adapted to these severe conditions have been installed. The doors are of the folding type, opening outward, and are manually operated. Manual operation is preferred by the company because the danger of freeze-ups in cold weather is eliminated. The doors are interlocked with the control, but the conductor's bell signal has not been done away with. This was tried, but it was found that if the motorman left the controller on the first point the sudden starting and rapid acceleration of a car as the rear door was closed was unpleasant to passengers and even dangerous. Instances occurred where a car started with a jerk before some elderly person had seated himself or herself and a more or less serious accident resulted. The present practice, therefore, is for the motorman to wait until he receives a signal from the conductor before starting the car. The interlocking arrangement, however, prevents the car being accidentally put in motion while the rear door is open.

The steps are fixed instead of being of the folding type, because the railway has found that in the territory where it operates folding steps are likely to become clogged with snow and ice during the winter. From the pavement to the step is 16 in., from the step to the platform 12 in. and from the platform to the car floor 8½ in. There is a 1½-in. ramp. No outside grab handles have been placed on these cars. As a substitute there are on each platform six stanchions of 1¼-in. enameled iron pipe. These are placed inside of the folding doors, one stanchion on the right, one in the center and one to the left of the opening. It has been found that there is no greater likelihood of boarding and alighting accidents with fixed steps than with folding steps provided there are no convenient hand holds on the outside of the car.

Although the first object sought in the design of this car was ruggedness, care has not been spared to make the interior attractive. The woodwork is



The Interior of the Car Is Pleasingly Free from Unsightly Apparatus

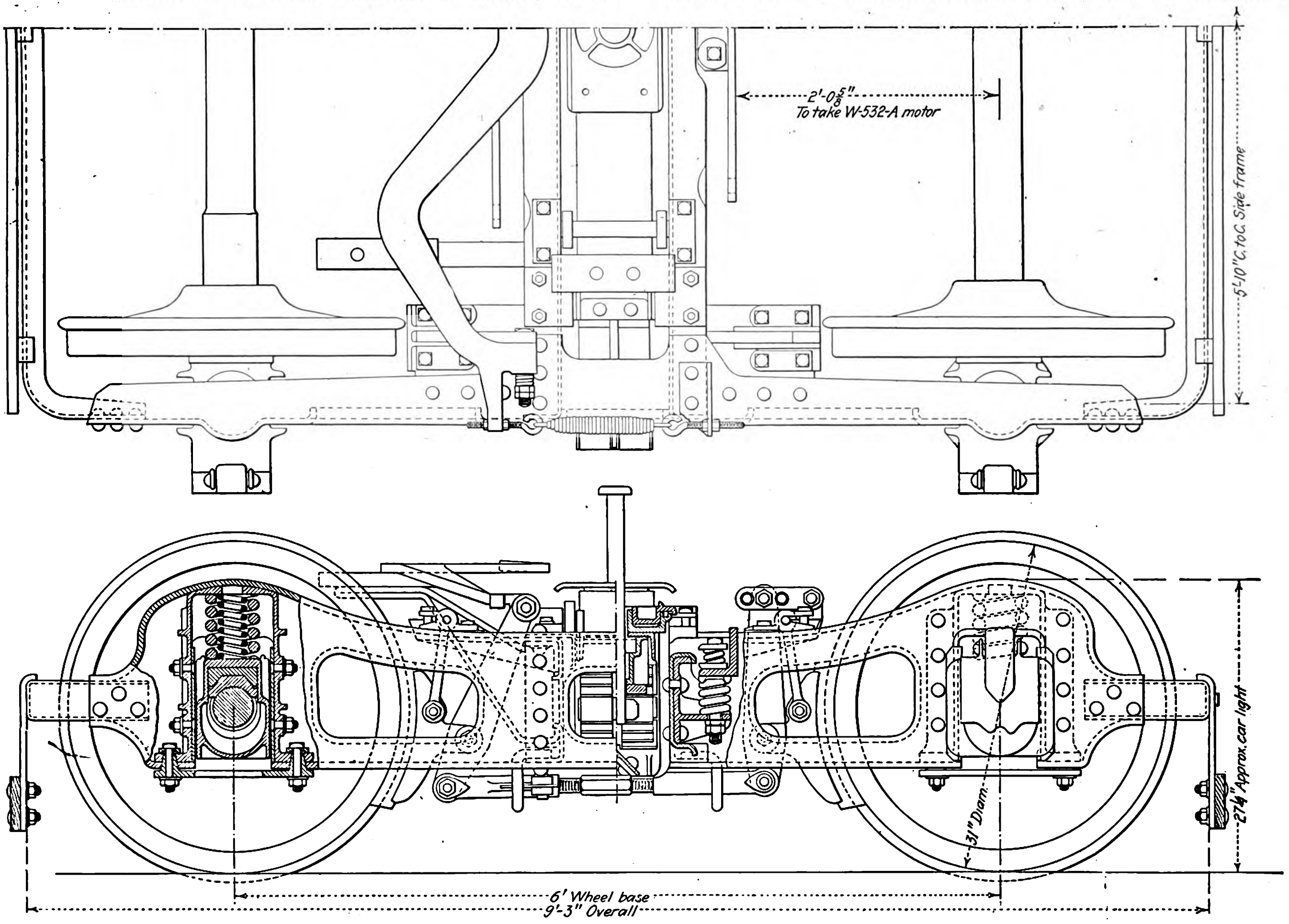
solid mahogany rubbed down with pumice stone and oil and left with a dead finish. Mahogany is preferred over any other wood on account of its better appearance and also because it does not warp readily. Cherry, however, is used for the seats, which run lengthwise of the car. No window curtains have been installed. The decision of the railway to use wooden slat seats and no window curtains was based on the fact that these cars are used on lines where the business is largely short-haul, and it was felt that the greater simplicity thereby accomplished counterbalanced any slight decrease in comfort.

An attractive feature of the car interior is the freedom from pipe, wires, bell cords, switch boxes, etc. All these things have been so located as to be entirely inconspicuous.

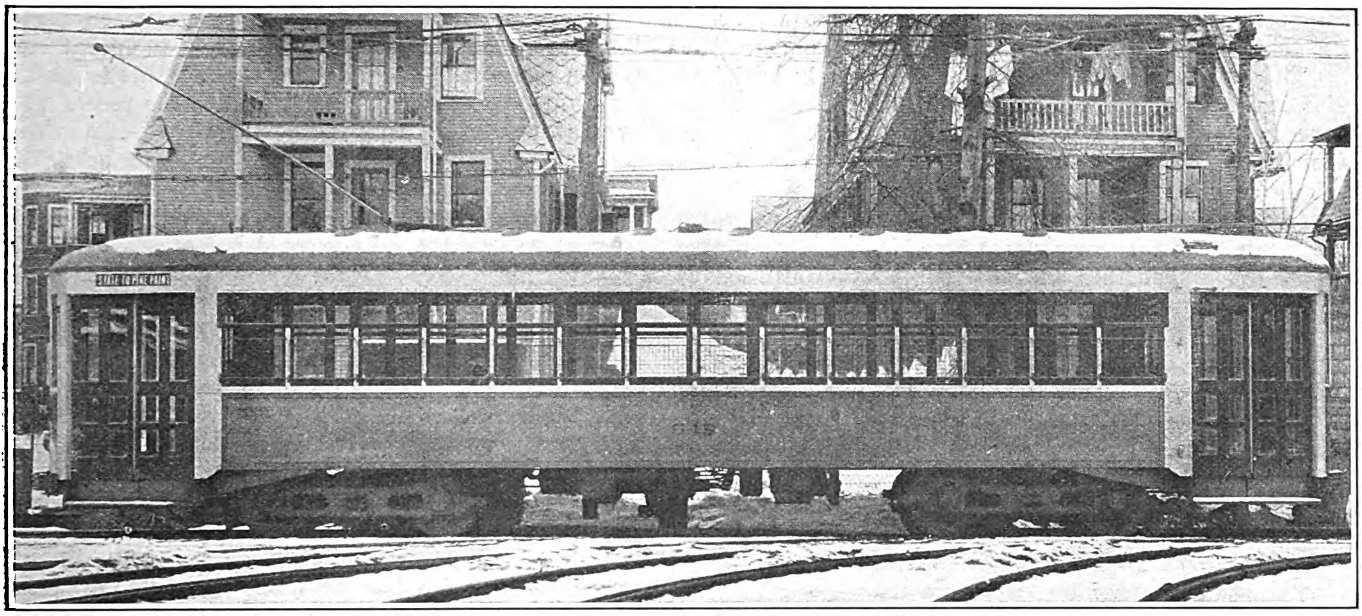
In order to assure sufficient warmth during the cold weather already mentioned, each car is equipped with 24 Cutler-Hammer electric heaters. Ventilation is accomplished by twelve Brill exhaust type ventilators. A double floor is used with felt in between two layers of tongued and grooved yellow pine, $\frac{13}{16}$ in. x $3\frac{1}{4}$ in., laid lengthwise. The roof is of $\frac{1}{2}$-in. matched white pine screwed to fifteen $1\frac{1}{2}$-in. x $\frac{3}{8}$-in. forged steel carlines. The ceiling is $\frac{5}{16}$-in. Nevaslip painted with pearl gray Vitrolite.

Artificial lighting in the car is provided by five center lights. In addition to these there are three lights used behind the destination signs and one in the headlight. There are in all six Hunter signs, one over each of the four doorways and one over the center vestibule window at each end of the car. An interesting feature of the lighting arrangement is the use of steel lamp shades inside the car. These are white enamel and are used instead of the ordinary glass lamp shade because of the danger of breakage when the conductor carries the International automatic fare box and registering apparatus through the car.

Ten of these cars were built by the Wason Manufacturing Company in 1923 and placed in service during last December. The side plates are $\frac{3}{32}$-in. steel. The exterior of the car is protected by eleven coats of paint.



Deep Sections, Pressed to Channel Shape, Give This Standard Truck Adequate Strength and Light Weight



These Cars, Being Large and Heavy, Are Good Snow-Fighters

These are, in order, a priming coat, a filler, four coats of rough rubbing material, two color coats and three coats of railway varnish.

The car weighs complete 42,200 lb. The principal dimensions are as follows:

| | |
|---|---|
| Length of body | 35 ft. 0 in. |
| Length over all | 48 ft. 4 in. |
| Truck centers | 24 ft. 0 in. |
| Width over all | 8 ft. 4⅝ in. |
| Height from rail to floor | 36½ in. |
| Height from rail to top of roof | 11 ft. ½ in. |

The trucks used are Standard C-50-P-L. They are of the built-up type without side equalizing bars, the side frames being pressed in one piece to replace the equalizers and to form pedestal ways, which are reinforced by steel castings. The frames are pressed to channel shape, and by using deep sections the weight of the truck has been considerably lessened without reducing the strength. Connections between the side frames and the transoms are stiffened by cast steel gussets which also serve as supports for the brake rigging.

The truck brake rigging is of the direct-connected type with extensions riveted to the truck side frames for the application of release springs. All pins are case hardened and all holes bushed.

Coil equalizer springs are placed on top of the journal boxes, giving a long spring base and easy riding. Riding qualities are improved by the use of volute springs in connection with the elliptical bolster springs. The combination is so arranged as to bring the volute spring into action only with a certain passenger load, thus allowing for a more ready deflection with lighter loads and a stiffening up with heavier loads.

Journal boxes are arranged to receive A.E.R.E.A. standard 3¾-in. x 7-in. journals and are fitted with A.E.R.E.A. standard bearings and wedges. Wear plates are attached to the pedestals and tie bars are also provided. The latter are jig drilled and so constructed as to insure a tight job.

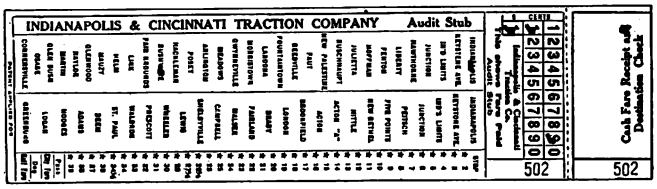
Bolsters are of the built-up truss type, the top member being a rolled channel and the bottom member a bar. They are fitted with the Standard Motor Truck Company's "Ideal" lubricated center plates and plain side bearings. The general arrangement of truck and arrangement of pedestal tie are shown in accompanying illustrations.

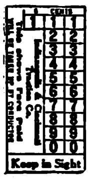
## New Duplex Ticket Promotes Tidiness in Cars

THE Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., has designed a duplex ticket form in which the stub given to the passenger acts as a cash fare receipt and also as a hat check. This ticket has the double advantage of promoting tidiness in the cars and facilitating the work of the conductor.

For several years the railway had been having trouble with the old type fare register used. When it was decided finally to give up these devices a question arose as to what should be used in their stead. The ordinary cash fare receipts were considered undesirable because so many passengers threw them on the floor, giving a very untidy appearance to the cars. The railway officials were particularly desirous of making a feature of clean cars when new rolling stock recently purchased by this company was placed in operation. This desire has resulted in the adoption of the new type ticket.

The ticket is about 8 in. long with a stub 1 in. long which is folded back, punched, torn off and given to the passenger. A long coupon carrying complete information concerning the journey is retained by the conductor and turned in to the auditor. The hat check given to each passenger when fare is paid is lifted by


INDIANAPOLIS & CINCINNATI TRACTION COMPANY
Audit Stub
CENTS
Indianapolis & Cincinnati Traction Co.
The above Fare Paid
Audit Stub
Cash Fare Receipt and Destination Check
502
502


CENTS
Keep in Sight

This Form of Duplex Ticket Recently Adopted by the Indianapolis & Cincinnati Traction Company Facilitates the Work of the Conductor. At Right Is Shown the Reverse Side of the Stub the conductor near the end of that individual's journey so that he does not throw it on the car floor.

The amount of fare punched is ordinarily sufficient information to show the passenger's destination. However, at the present time it is the practice for the conductor to make a pencil notation on the back of the check showing the number of the station to which the passenger has paid fare. Sometimes passengers desire to retain cash fare receipts to accompany their expense accounts. When this happens there is no objection to permitting them to retain the checks because the serial numbers prevent their use for repeated trips.

The new ticket is printed on paper stock which is about half way between ordinary hat check stock and cash fare receipt stock. On account of being printed flat, however, the extra weight of the stock does not result in a cost higher than that of a thin folded duplex receipt. The tickets are carried flat and the small receipt check can be folded over so easily that the whole operation is thought by the company to be faster and easier for the conductor than with the ordinary duplex fare. Rights to manufacture and sell the new type ticket have been acquired by the National Ticket Company of Cleveland.

# Largest Open Cars Converted for One-Man Operation

### Public Service Railway of New Jersey Has Removed Running Boards, Screened Sides and Cut an Aisle Through Middle of Its Latest Type Summer Cars to Permit Operation by One Man

A VEHICLE possessing a number of unique features has resulted from the conversion by the Public Service Railway, Newark, N. J., of 50 of its most modern open type cars for one-man operation. These cars were built only a few years ago and are believed to be among the largest open street railway cars operated in the country, seating 96 persons. Reconstruction included removal of the double running boards, installation of screens between the posts, placing of doors at both ends to close the vestibules and cutting of an aisle through the middle of the cross-bench seats.

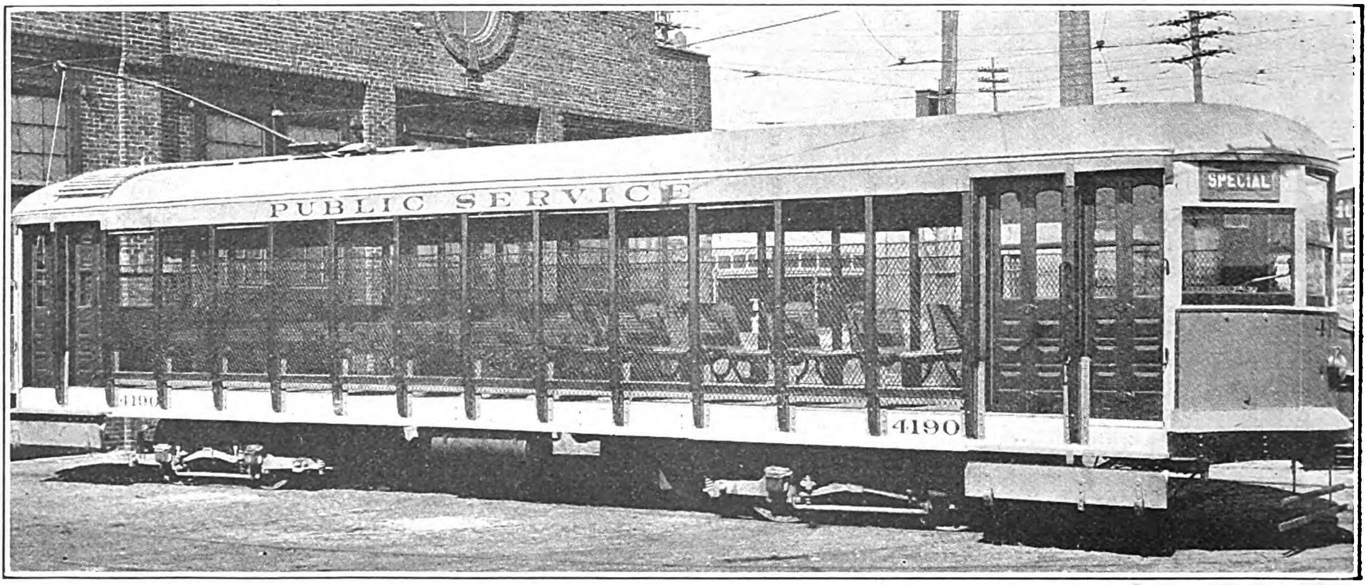
For many years it has been customary on certain divisions of the Public Service Railway to operate open cars in summer. Two hundred cars of this large type are ordinarily used in Newark. Since the recent adoption of the 5-cent fare the company has inaugurated one-man operation on many of its lines, including several lines which formerly used open cars in summer. With the approach of warmer weather the question arose as to how these lines could be operated. Conversion of some of the open cars for one-man operation has been the company's answer.

The vestibule doors are all operated pneumatically and are arranged to be controlled from the motorman's position. Entrance and exit will be by the front doors. The rear doors are for emergency exit, but they can be controlled from the rear end if it should be desired to operate the car with two men.

The removal of the double running boards from the near side and the installation of screens between the posts is expected to result in a reduction in the number of accidents, which has naturally been high with this type car. Closing up fifteen of the sixteen former entrances to the car might be expected to result in decreasing the speed of operation. The company questions, however, whether this will actually occur. In practice it was frequently necessary with a car of this type to wait while a prospective passenger walked up and down alongside the car looking for some special seat that took his or her fancy.

The seating capacity has been reduced from 96 to 62. One bench has been removed altogether, causing a loss of six seats, and 14 benches have been cut through by the aisle, causing a loss of two seats per bench, or 28 all told. Thus 34 seats have been lost. This loss, however, is not so serious in reality as it might appear, because it was comparatively seldom that the six seats on each bench were all taken. Some loss in carrying capacity will result from the elimination of the running boards, although the running board load will largely be transferred to the center aisle.

Another important feature of the conversion is the fact that these cars can now be operated on the pay-as-you-enter or pay-as-you-leave plan, instead of having the old-fashioned hand collection, as was necessary before.



Fifty Cars of This Type Are Being Converted by Public Service Railway for One-Man or Two-Man Operation

# Relieving Congestion on Atlanta Streets

### Street Cars Forming 9 per Cent of Total Vehicles In and Out of Business District Carry 72 per Cent of the Passengers

THE relocation and wider spacing of many car stops, the berthing of at least two cars at a time in the downdown district to receive and discharge passengers, the installation of more raised safety loading platforms, employment of additional street collectors to enable passengers to get on both front and rear ends of the cars, better parking restrictions, giving precedent to street cars over all other forms of traffic, and co-ordination of all other traffic with the movement of street cars are included among the recommendations recently made to the City Council of Atlanta, Ga., by John A. Beeler, consulting engineer, New York. These are contained in a preliminary report, bringing attention to remedial measures that are immediately available for relieving the traffic situation without loss of time or any considerable expenditure of money.

One of the most interesting parts of this preliminary report is a study showing the relative efficiency of street cars and other vehicles in the use of the streets. A check was made covering the number of street cars and other vehicles, and the number of riders entering and leaving the business district on the main thoroughfares during the hour from 5 to 6 p.m. The results are summarized in the following table:

| | Street Cars | Other Vehicles |
|---|---|---|
| Number of units | 346 | 3,505 |
| Total passengers | 16,286 | 6,345 |
| Passengers per vehicle | 47 | 1.8 |
| Per cent of total traffic units | 9 | 91 |
| Per cent of total passengers | 72 | 28 |
| Number of street cars required to handle all passengers | 482 | ..... |
| Number other vehicles required to handle all passengers | ..... | 12,552 |

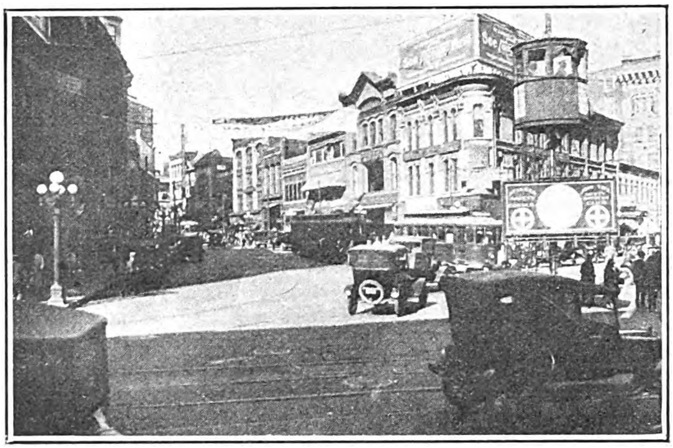
The number of vehicles recorded includes both horse-drawn and motor-driven units, although the former constituted but 1 per cent of the total. Hired drivers of taxicabs and jitneys were not included as passengers. The total number of units observed was 3,851, of which 346, or 9 per cent, were street cars. The total passengers carried were 22,631, of which 16,286, or 72 per cent, were on the street cars. Each street car thus carried 26 times as many passengers as the other vehicles, the average on other vehicles being 1.8 passengers.

On the basis of this loading, 136 more street cars, making a total of 482, could have handled all of the passengers, thus decreasing the total units using the streets from 3,851 to 482. To handle this same number of passengers in vehicles other than street cars would have required 12,552, or more than three times the number now used. The report points out that these figures show the relative importance of the street car and indicate that it is the prime factor in handling mass transportation. The necessity for speeding up its movement and increasing its general efficiency is thus extremely important from the viewpoint of the car rider and public generally.

## MAIN CAUSES OF CONGESTION

In discussing causes of the severe congestion in Atlanta, the consultant points out that the total population of 240,000 people living within the city limits is within an area of 26 square miles. This gives an average of 9,230 people per square mile, which is stated to be 50 per cent higher than the average of other cities of a size similar to Atlanta. The number of automobiles recorded by the registration in Fulton and DeKalb Counties, which have a total population of 310,000 people, has grown from 13,446 in 1918 to 38,251 in 1923.

The principal business district of the city is comprised within an area approximately 1,500 ft. wide by 3,000 ft. long, which is equal to less than one-sixth of a square mile. Most of the streets in the business section are narrow and some of the most important ones end blindly, others do not match up. In addition to this, practically all of the streets in this district, whether east and west or north and south, converge into Peachtree Street. This concentration of business district and layout of streets result in a tremendous concentration of vehicular and street car traffic.



**Five Points, in the Heart of Atlanta, Ga., Where Five Streets Converge, Creating a Most Difficult Job for the Traffic Officer and Slowing Up Street Cars and All Traffic**

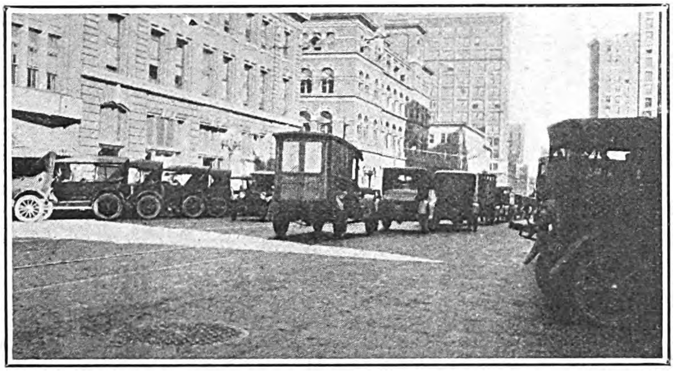
Checks of motor vehicle speeds on the main thoroughfares of the business district between the hours of 4:30 and 6:30 p.m. showed an average speed on Peachtree Street of 7.67 m.p.h.; on Forsythe Street of 6.28 m.p.h.; on Broad Street of 6.65 m.p.h.; on Marietta Street of 7 m.p.h., and an average for the district of 7.14 m.p.h. Checks of street car speeds in this district during the evening rush hour show the following average speeds in miles per hour: On Peachtree Street, 4.29; on Forsythe Street, 4.58; on Broad Street, 4.10; on Marietta Street, 3.43; and average for the district, 4.11. The low average speed shown on Broad Street, the consultant explains, is due to the fact that the cars turn on and off Broadway at every street intersection in the district, while on Peachtree and Forsythe Streets they nearly all go through. The slowest speed of all in the district was on Decatur-Marietta Street, the main east and west traffic way, where it was 3.43 m.p.h. Here the car stops are closer together, a large number of both right and left hand turns occur at Broad, and the traffic delays at Five Points all tend to retard traffic movement.

## REMEDIES SUGGESTED

As to the remedies suggested and summarized at the opening of this review, the report points out that car service may be improved and general traffic movement aided by the expedient of placing car stops farther apart and where they will least interfere with traffic movement. In places the stops are now but 250 to 300 ft. apart.

In connection with traffic regulation and parking, the report states that "where either loading platforms or safety zones are installed, they will fail of their purpose unless traffic is kept moving. Regulations should be such that vehicles will not be required to stop behind standing street cars, but will proceed past the safety zones or platforms whenever the traffic officers permit. No vehicles should be allowed to stop opposite platforms or safety zones at any time except for traffic control.

"Vehicles must keep clear of the car track in approaching street intersections, and at all double berthing and loading points. Owing to their superior carrying capacity, the street cars should be given the preference as far as practical in crossing movements by traffic officers, and the other movements co-ordinated therewith. This will facilitate the movement of the greatest number of people with a minimum loss of time. Full recognition of the relative importance of the various factors in mass transportation must not be lost sight of.



**Diagonal Parking Is One of the Evils with Which Atlanta Is Beset, as Seen on Marietta Street Looking Toward Five Points**

"The system of controlling traffic by means of signal lights is a commendable one, but it will fail of its chief purpose if personal supervision is lacking in directing the more complicated traffic movements."

It is pointed out that angular parking is especially undesirable, as it not only occupies a large amount of the street space, but causes traffic interference and increases the accident hazard on account of the backing out of automobiles from the curb. The report comments that there may be as yet no general necessity for prohibiting all parking during the rush hours, but that the time is rapidly approaching when all parking will be prohibited on the main thoroughfares of important cities and their use given over solely to moving traffic. Such action is necessary in Atlanta along the three blocks on Peachtree Street between Luckie and Ellis Streets. This constitutes the chief bottle neck through which the heaviest car and vehicular traffic passes in entering and leaving the business district.

## Street Cars Still Are Wanted

THE inquiring reporter of the Chicago *Tribune* asked a thought-compelling question the other day, and the answers indicated that people do not take their transportation quite so much for granted as might be assumed.

"If the pages of history were to be turned back one hundred years, which of the modern conveniences you now enjoy would you dislike most to give up?" was the question the reporter asked of three men and two women.

Two men frankly declared that most of all they'd hate to lose the street cars. They admitted they couldn't afford autos, and if the street cars were not present they'd have to walk. The other man declared all methods of transportation were the most important to him. The women were divided between an electric curling iron, electric washing machine, sewing machine, automobile, telephone and electric lights.

# The Readers' Forum

### *Houston Situation Much Improved*

CITY OF HOUSTON
*Legal Department*

HOUSTON, TEX., May 14, 1924.

To the Editors:

It is with a great deal of interest that as city attorney of Houston I have read your synopsis of Mr. Beeler's report on our street railway situation. (Issue of March 15, 1924, page 407.) This situation has been a source of constant unrest and threatened litigation for a number of years.

Some months back the City Council authorized Mayor Holcombe and myself to select an expert to investigate and report on our local street car situation, and we were not limited as to the amount we should pay nor was any suggestion made as to the organization we should employ.

The Beeler Organization made a very thorough and extensive study of our problem and submitted to us a report which we feel correctly analyzed the situation and suggested the remedy. This matter was placed before the public and at an election held in our city under the referendum provision of our charter the people voted approximately three to one to adopt Mr. Beeler's report and to settle the street car controversy along the lines recommended.

This action was taken by the City Council and we feel that a most satisfactory solution of our transportation problem has been arrived at. The street railway company is so far living up to its part of the agreement to the letter and has adopted the suggestions contained in the Beeler report, with the result that our street car service is now more satisfactory than it has been in the last twelve to fifteen years.

We naturally feel very grateful to Mr. Beeler and his assistants for their work in this matter, and I believe that this same feeling is shared by practically all of our citizens. Mr. Beeler's report showed that he had a very thorough grasp and understanding of street railway transportation, and it was so fair and unbiased that there was no difficulty in our getting upon common ground and satisfactorily adjusting our difficulties with the street car company.

In view of the good work done by Mr. Beeler and his associates, we feel that it is but fair that we let those interested know how we feel about the matter.

SEWALL MYER, City Attorney.

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The Los Angeles Railway has adopted the practice of notifying the public in advance of parades and other events which will affect the service. Being in possession of this information, riders can arrange their travel to avoid the interruption.

# Association News & Discussions

## Regional Plan Committee Discusses Traffic

VARIOUS phases of the traffic problem in the metropolitan district were discussed at a conference held at the Town Hall, New York, on May 20 under the auspices of the Committee on a Regional Plan for New York and Environs. About 200 delegates from civic, municipal, commercial and industrial organizations within 50 miles of Manhattan attended the meeting and took part in the discussions.

Although the principal object of the conference was to emphasize the fact that the traffic problem in New York city is a very serious one, several suggestions were made for its solution. In the report of E. P. Goodrich, consulting engineer of the committee, the cost of traffic congestion on Manhattan Island was estimated at $500,000 a day, and the cost of congestion in the whole region at $1,000,000 a day. Approximately 2,030 persons were killed by motor vehicle accidents in New York and its environs during 1923, and it is estimated that with a registration of 2,180,000 vehicles in 1930, there will probably be 4,100 fatalities that year.

Among the causes of traffic congestion mentioned in this report are narrow streets inherited from former times, building heights too great for the capacity of adjacent streets, lack of zoning ordinances to regulate the size and use of buildings, lack of planning ordinances to prevent laying out new streets too narrow for their ultimate use, inadequacy of arterial thoroughfares and lack of a comprehensive plan for the development of the region. Although there is already in New York City a motor vehicle for every 16 persons, and in the metropolitan district one for every seven persons, the automobile saturation point in this region will not be reached until 1950, according to the estimates of Mr. Goodrich, when he expects there will be 16,800,000 persons, and a motor vehicle for every 3½ persons in the region.

In discussing possible solutions of the traffic problem in New York City, Mr. Goodrich, Mayor Hylan and H. W. Corbett, an architect, suggested the removal of all surface and elevated railways. It was proposed that the passengers now carried by these lines might in that case be carried by buses or by new underground rapid transit lines. Mr. Corbett also suggested that the street surface should be given over entirely to vehicular traffic and pedestrians accommodated by second-story arcaded sidewalks within the building lines. Graceful bridges would span the streets connecting these arcaded sidewalks, and in his imagination, the streets of New York would then resemble the canals of Venice. Among the other suggestions made for the relief of traffic congestion were the creation of new highways to by-pass congested areas and the limitation of building heights by institution of a graduated tax on buildings according to their height.

High buildings are a direct tax on the community, through the necessity of maintaining fire-fighting facilities of excessive capacity and cost. The elevators in high buildings require extra annual inspection. Potential accidents during fires in high buildings are more serious than in low ones. High buildings cast shadows over adjoining properties and deplete the physical stamina of tenants. Other economic objections exist to such structures, and some means should be found to make them contribute to the relief of the financial burden which they place directly upon the shoulders of the community.

That what is most needed now is more good railroad engineering in solving the traffic problem was the opinion expressed by J. Rowland Bibbins, consulting engineer, Washington, D. C. He stressed the need for bringing experienced transportation men into active co-operation with the work of the committee.

The scope of the regional plan was outlined by Frederic A. Delano. Among the major questions which the committee is considering he mentioned development of the water front, housing, zoning, parks, need for additional bridges, and highways. Others who spoke at the conference were George S. Silzer, Governor of New Jersey; George R. Lunn, Lieutenant-Governor of New York; John F. Hylan, Mayor of New York City; Robert W. de Forest, president Russell Sage Foundation; Arthur S. Tuttle, chief engineer Board of Estimate; General H. L. Scott and Walter Kidde, New Jersey State Highway Commission; Dwight W. Morrow, Lawson Purdy and George McAneny, chairman New York Transit Commission.

# American Association News

## Subjects and Meetings

THE committee on subjects and meetings met in New York on May 16 to shape more definitely the program for the annual convention at Atlantic City. The members present were: Frank R. Coates, chairman; F. W. Doolittle, Harry L. Brown, Cornell S. Hawley and Secretary J. W. Welsh. The program was tentatively outlined as follows, speakers were agreed upon and the work of securing them put in motion:

*First day:* A paper on "Financing of Electric Railways." Another paper on "Customer Ownership," followed by discussion on the subject by a representative of a holding company in the East and one in the West.

*Second day:* Two papers on "Coordination of Motor Vehicle and Electric Railway Service by Electric Railway Companies," to be presented by a speaker representing the motor vehicle interests and by a railway man.

"Necessity of Electric Railways to Communities," a symposium to be participated in by the mayor of a city, a real estate man, an officer of the U. S. Chamber of Commerce, a public utility commissioner, and a manufacturer.

*Third day:* "Management and Modernization." The time at this session will probably be turned over to the committees on interurban and city operation, which will present a five-minute report from each of the fourteen regional vice-chairmen, introduced by a general report of each committee chairman.

The committee decided to recommend to the executive committee that no business meetings be held on Wednesday, making this the day off for all associations for inspection of exhibits. The executive committee will also be called on to decide whether the American Association meetings shall be on Monday, Tuesday and Thursday mornings or Tuesday, Thursday and Friday mornings, the latter having prevailed as the recommendation from the subjects and meetings committee.

The committee also voted to have a special committee appointed, with President Budd as chairman, to make formal inspection of exhibits of manufacturers, as was done last year.

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## Valuation

A MEETING of the committee on valuation of the American Association was held at association headquarters, New York, May 19. Reports were received from the various sub-committees containing the material to be included in the annual report of the committee. There was considerable discussion, particularly regarding the terminology to be recommended by the committee and the relative weight of the several elements going to make up cost and value.

Members of the committee present were: F. W. Doolittle, chairman; E. J. Bechtel, H. A. Clarke, Thomas Conway, Jr., J. A. Emery, T. E. Francis, W. H. Maltbie, L. R. Nash, A. S. Richey and Frank Silliman, Jr.

# Maintenance of Equipment

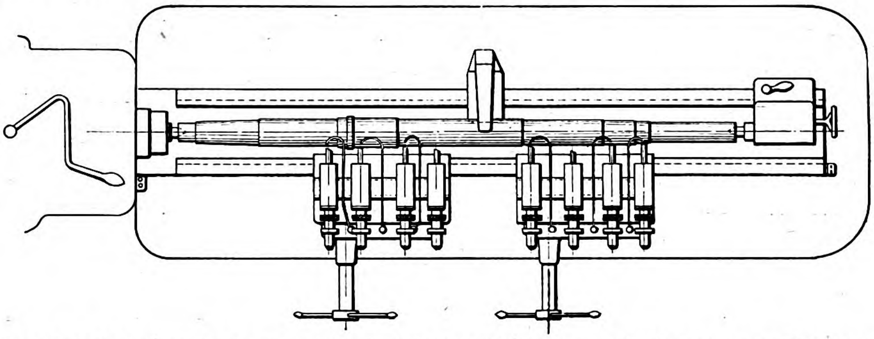
## Tripling Armature Shaft Production

By O. H. Jorgensen
Chief Draftsman Equipment Department,
Chicago Surface Lines

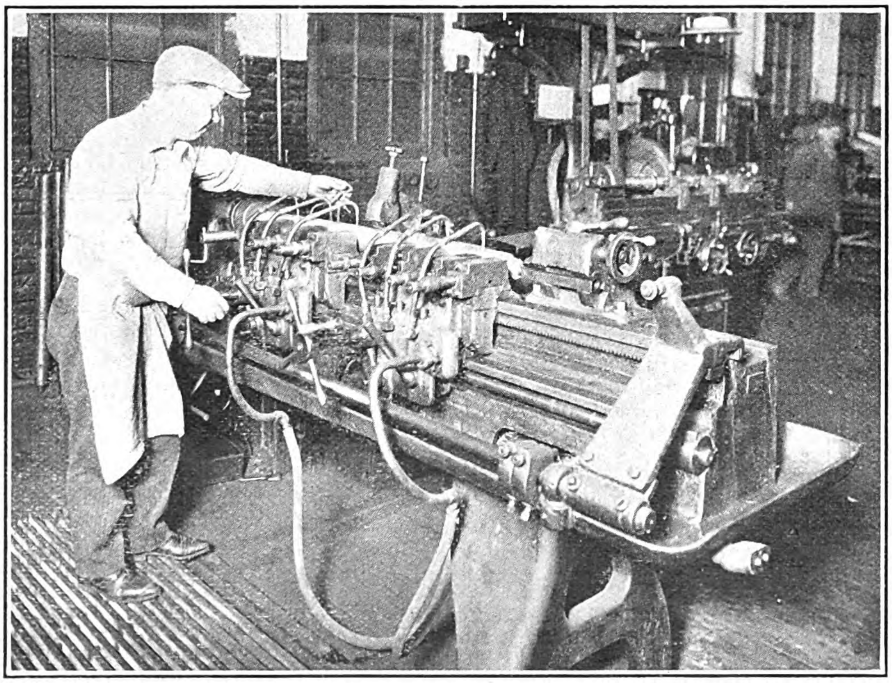
An example of the saving which can be effected by the use of modern machine tool equipment is furnished by the "Lo-Swing" lathe in the West shops of the Chicago Surface Lines. This machine, which is used for turning armature shafts for replacements, turns out eight and one-half shafts in eight hours, in comparison with three shafts turned out in the same time by a single tool post engine lathe operated by a highly skilled and efficient machinist. Thus by the use of this machine the production has been practically tripled with no increase in labor costs.

The figures quoted are taken from shop records over a period of two years and include the time required for setting up the machine, which averages two hours for each different size of shaft.

Armature shafts are delivered to the "Lo-Swing" lathe in the rough-turned state, as they are received from the steel mill. The rough-turned diameters are $\frac{1}{8}$ in. greater than the finished diameters, and these again are $\frac{1}{32}$ in. larger than the finished sizes after they are ground. The shafts are lifted and handled by means of a hand-operated chain hoist traveling on an I-beam, and after being centered, are turned in the "Lo-Swing" lathe and are then moved by the same crane to the grinder.



The Two Carriages May Be Driven Simultaneously from the Lead Screw, or Independently, Either from the Lead Screw or by Hand. The First Tool on the Left Has Finished Its Cut and the Remaining Five in Operation Will Finish Simultaneously



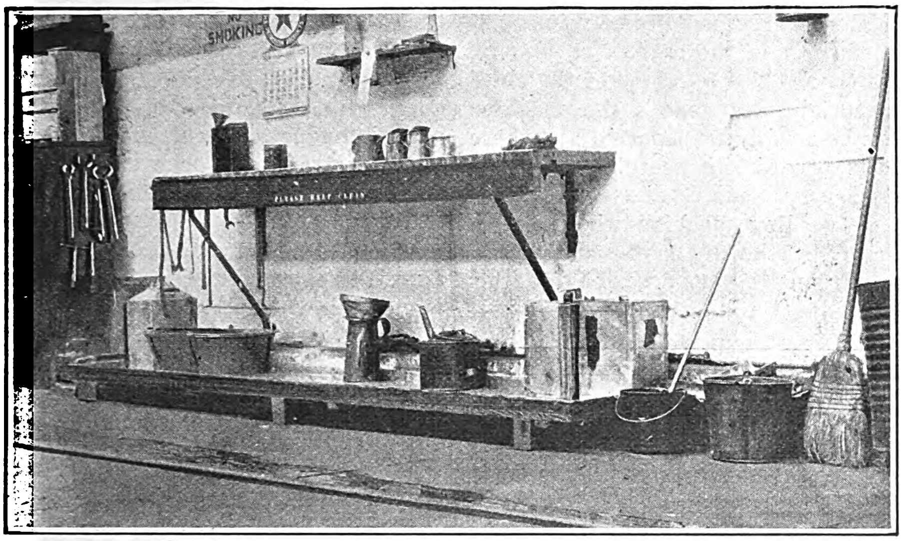
In the West Shops of the Chicago Surface Lines, This "Lo-Swing" Lathe Turns Practically Three Times the Number of Armature Shafts Formerly Produced in a Single Tool Machine

An accompanying illustration shows the lathe in operation, and the line drawing illustrates the set-up with six tools of the eight in the cutting position and the turning operation nearly completed. The first tool on the left has finished its cut, and the five other tools will finish simultaneously. Automatic stops are provided for limiting the travel of each carriage either together or independently.

On the machine illustrated, which is called a $3\frac{1}{2}$-in. size and is manufactured by the Fitchburg Machine Works, Fitchburg, Mass., a shaft having maximum dimensions of 4 in. diameter and 60 in. length can be handled. Although only six tools are used in turning armature shafts, the machine will accommodate eight. A pump mounted in the base casting and driven through spur gearing from the driveshaft provides a continuous flow of cutting lubricant to the tools. Each of the six adjustable nozzles distributing the lubricant has a shut-off valve.

A switch for stopping the driving motor is mounted at each end of the machine. The two carriages may be set to operate in unison from the lead screw, or may be operated separately either by hand or by the lead screw. The shank of each tool holder is equipped with a graduated dial, enabling the operator to increase or decrease the depth of his cuts with close accuracy.

A 10-hp. individual motor, having a speed of 900 r.p.m., drives the lathe by means of a Morse silent chain. The use of chain drive on this machine was an experimental installation and has been very successful.



Shelf and Bench for Lubricants Arranged to Keep Them Free from Dirt

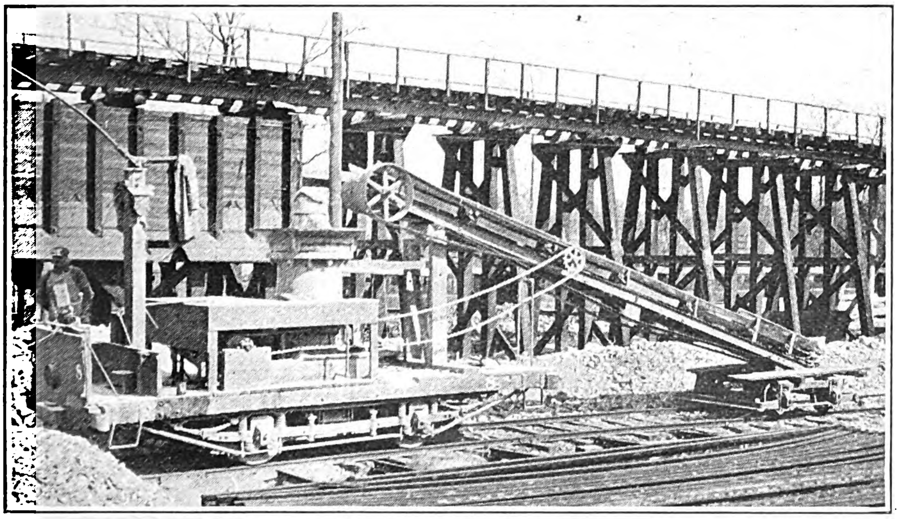
## Shelf and Bench Keep Lubricants Clean

THE importance of keeping lubricating oils free from dirt has been emphasized particularly to the employees connected with the equipment lubrication on cars of the Philadelphia & Western Railway, Norristown, Pa. To assist in keeping clean the funnels, measures and other utensils used in connection with lubrication, a shelf and oil bench have been constructed along the wall of the shop adjacent to the inspection tracks. The shelf is supported by brackets at either end. The top is covered with tin, so that it can be cleaned readily and be kept clean easily.

A tray for the pans and larger utensils has been constructed underneath the shelf. This is about 8 in. above the floor level, 12 ft. long by 2 ft. wide, and is also lined with tin. The walls adjacent to this oil bench are whitewashed and the floors are given particular attention in order to keep them clean and free from dust. A sign stenciled along the front edge of the shelf reads "Please Keep Clean."

## Crusher Car Converts Concrete Into Ballast

A CONVENIENT apparatus for converting old concrete track foundations and worn paving blocks into ballast has been designed by the Memphis Street Railway, Memphis, Tenn. An Austin No. 3 stone crusher has been mounted on the framework of an old single-truck car. This is fed by an inclined belt conveyor, the outer end resting on a light railway truck and the inner end being supported just above the crusher. This apparatus has been successfully used on several recent track reconstruction jobs and has provided material for ballast at a considerable saving from the cost of new material.



Rock Crusher Mounted on a Single-Truck Car Is Economical Means of Converting Paving Material Into Ballast

## Some Essentials for Bonding and Welding Repairs

By J. C. Lincoln

Liteweld Company, Cleveland, Ohio

THE great advantages of electric welding and bonding equipment for electric railway companies have long since ceased to be questioned by executives in the field. The value of this class of maintenance tool in reducing maintenance costs and in speeding up repairs to cars and track has been definitey proved, but the widely differing costs obtained by various roads indicate that the skill of the operator and the design of the welding machine itself play an important part in the amount of saving to be made.

The operation of a welding machine is comparatively simple, certainly much more so than almost any of the other types of machine tools used by the maintenance department. But just as it would be unreasonable to expect that any one can be relied upon to produce satisfactory work on even a drill press, so it is true that a certain amount of aptitude and interest is necessary in order to make a good welder. Given these, practice will soon give the requisite neatness and speed.

A good operator should have a reasonably clear idea of the effect of heating and cooling upon the weld itself and upon the metal behind it. He should realize the importance of avoiding undue expansion and contraction, especially on car repairs, and he should be ambitious to learn. With these qualifications any reasonably handy man can be trained to save many times the cost of his time by reclaiming equipment which would otherwise rust uselessly on the scrap pile.

The design of the welding machine itself is, however, hardly less important. The efficiency of even the best of operators may be much hampered by unsuitable equipment. The choice, therefore, of a welding and bonding machine for electric railway work is worthy of careful investigation.

The requirements of railway maintenance work differs considerably from those of industrial welding. It is sometimes assumed that a welding machine of this latter type, which may be giving excellent results in a factory on the work for which it was designed, will be equally applicable to bonding and other railway work, but this is not necessarily the case.

The industrial welder, when used

on production work, has its current requirements more or less limited. Overload capacity, although desirable, is not usually essential. The electric railway welding machine, on the other hand, must be prepared to tackle any work that comes along, from repairs on a worn frog to building up a cracked car-frame. Overload capacity is thus a necessity.

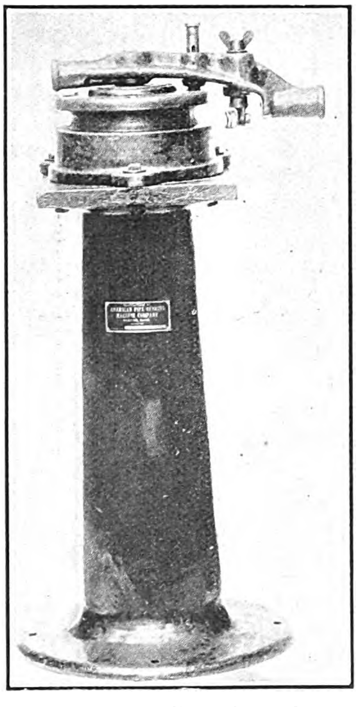
Portability in the case of an industrial welder is usually of minor importance. In the case of an electric railway welder it is one of the chief essentials, for unless the machine can be readily transported anywhere it is needed, its usefulness will be much curtailed.

A welding machine which is believed by the writer to meet these requirements was described in this paper last week.

# New Equipment Available

## New Pipe-Bending Machine

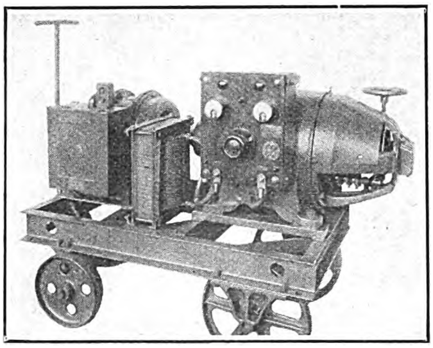
A MACHINE designed particularly for making cold pipe bends to a very small radius has just been placed on the market by the American Pipe Bending Machine Company, Boston, Mass. This machine will bend pipe cold up to and including a diameter of 1¼ in. The manufacturer states that pipe can be bent on this machine to a very small radius without splitting, crimping, or flattening.



Machine for Bending Pipe Cold to a Small Radius

## Portable Arc Welder

A NEW portable arc welding set embodying features of economy and simplicity is being marketed by the General Electric Company, Schenectady, N. Y. This unit is designed to insure smooth and rapid deposition of metal with thorough penetration. It will deliver continuous power and permit rapid production, both with high current and large electrodes, as well as with low current and small electrodes.



Portable Welding Outfit

This welder is a two-unit set, consisting of a motor and a generator. The generator is self-excited and all regulation of current is accomplished by turning a handwheel on the generator. A self-adjusting, stabilizing reactor is provided, which automatically steadies the arc under all welding conditions. It can be used with any of the commercial sizes of metallic electrodes from 1/16 in. to ¼ in. diameter. The generator voltage can be adjusted to suit the character of the work. Any value of current between 75 and 300 amp. can be obtained in a large number of steps between these limits.

Among the advantages claimed for this outfit are an arc easy to start and maintain, roller bearing wheels, holes in base for crane hooks and adaptability to long or short leads, for working close by or at a distance from the set.

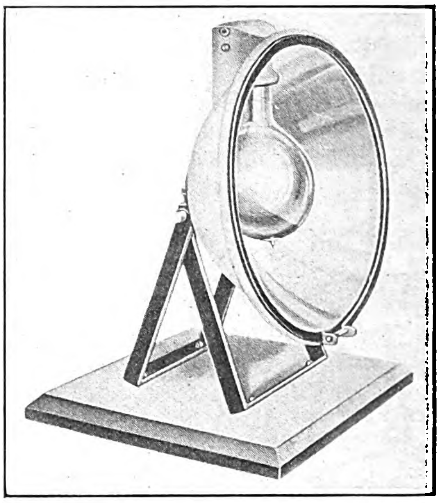
Among the mechanical advantages are included motor and generator insulation designed to withstand severe operating conditions both with regard to duty cycle of the load imposed and general atmospheric conditions under which ordinary insulation fails. Bearings are waste-packed and oil cannot be spilled if the set is tipped when being moved.

A WD-12 generator is used. This is a two-pole, self-excited, constant-energy, single-operator machine with a dual magnetic circuit designed to operate at 60 volts open circuit and 20 to 25 volts under load. It is rated 200 amp. for continuous service, 250 amp. for one hour and 300 amp. for short periods. The motor is a standard General Electric 10-hp. unit. The complete set has three bearings, the two units being close-coupled by a solid flange coupling. All parts, including generator, motor, generator control panel, motor starter and stabilizing reactor, are mounted on a welded structural steel base of rigid construction and light weight.

The assembled unit is about 63 in. long, 29 in. wide and 47 in. high, weighing about 1,600 lb.

## Floodlight Projectors for Night Work

THE Western Electric Company, New York, N. Y., is offering a new line of seven Davis floodlighting projectors. The Sunlight projector shown herewith is particularly suitable for the illumination of track which is being repaired or laid at night, and excavating jobs. This projector can also be used indoors as well as out. The housing is of spun aluminum highly polished on the inside to form the reflector. It is supplied either with or without a front glass and is provided with a simple socket adjustment to adapt it for use with 300 to 500-watt Sunbeam Mazda lamps. Smaller sizes from 100 to 200-watt lamps can also be used by applying a reducer to take the medium base.



Floodlight Projector for Temporary Lighting at Night of Excavating and Similar Jobs

# The News of the Industry

## Cincinnati Paying for Mistakes

### Expert Reports That City Erred in Its Fare Policy—Car Riders Now Suffering

Street car riders in Cincinnati, Ohio, are paying the penalty of the mistakes made by city officials. This is perhaps the most important criticism contained in a recent expert report. On the other hand, recommendation is made that the Cincinnati Car Company refund to the Cincinnati Traction Company at least a portion of the profit which was found to have been made by the car company from transactions in steel rails between the two companies. This last suggestion was made to Judge Robert S. Marx of the Hamilton County Superior Court in the Master Commissioner's report on the past ramifications of the traction company.

This was the only criticism of the traction company to be found in the report, which was filed as a part of the litigation in the suit brought against the traction company by Robert S. Alcorn, attorney, as a taxpayer. Alcorn sought to compel the company to return to the city $1,050,000 in what he claimed to be deficiency in the payment of franchise taxes to the city, and to enjoin the traction company from charging a higher rate of fare than 5 cents. The report placed the blame for the present condition of the company, together with the present high fare, upon the city of Cincinnati.

### Railway Free of Franchise Claims

The report not only holds that the traction company should be adjudged free of any of the franchise claims set forth in Mr. Alcorn's suit, but says that because the city officials insisted on an initial 5-cent fare at the time of framing the service-at-cost ordinance, the car riders will have to take the consequences, arising from the present deficit of the traction company and pay much higher rates of fare in the future. The efforts of the city officials at the outset to keep the fare down merely added to the deficit of the traction company, and except for the attitude of the city officials on this matter the fare would probably never have mounted to more than 8 cents, the Master Commissioner says in his report.

The report was filed by Carl A. Nau of Cleveland, appointed Master Commissioner in the case by Judge Robert S. Marx to examine the books and records of the traction company. Assisted by other members of his firm, Nau, Rusk & Swearington, Mr. Nau made an investigation which lasted more than a month, and extended into every phase of the companies' enterprises since 1917, when the service-at-cost ordinance was put into effect.

Mr. Nau blames the present predicament of the company on the fact that when the service-at-cost franchise became effective the fare was placed at 5 cents. This rate of fare was known to be inadequate to meet the cost of operations and the fare should have been 6 cents, the accountant says. Thus the scheme started, his report states, with a known loss in operation, and instead of providing a surplus to absorb future losses, it began with a deficit which never has been overtaken. Tracing the result of this mistake, the report says:

> By the end of 1919 this accumulated deficiency amounted to $1,669,597. An attempt to keep fares from going up still further, and at the request of the city, this deficiency was funded by the issue of $2,000,000 in debenture bonds.
>
> When a deficit of $665,304 occurred in 1920 the city passed ordinances deferring payment of the $350,000 franchise tax to prevent further increases in fare, but this action was only a temporary expedient and merely postponed the evil day.
>
> Had the initial fare been made 6 cents and then increased or decreased, it is our opinion that the maximum fare would never have exceeded 8 cents and that there would be no necessity for the present 9-cent fare.

The cost of making the examination was borne by W. Kesley Schoepf, president of the Cincinnati Traction Company.

## Impressive Safety Parade in New York

Barron G. Collier, special deputy police commissioner of New York City, was grand marshal of a public safety parade under the auspices of the Bureau of Public Safety, Police Department, on May 17. Fifth Avenue was the scene of this two-hour procession, which included floats and marchers and bands and banners, presenting innumerable safety slogans and representing nearly everyone interested in safety work—except the street railways.

The parade was quite a picturesque and impressive dramatization of the need for carefulness and the penalty for carelessness. It was viewed along the line of march by probably several hundred thousand people, who must certainly have carried away with them a new thoughtfulness for playing safe.

In a foreword in the program of marching order of the parade, Mr. Collier said:

> It has been our hope that this parade would so graphically present the story of the bureau and its work that each of you would feel the message that it has for you; that you would leave knowing that safety is a personal and individual matter, and that the responsibility rests upon you too, in order that we might have your co-operation to the fullest extent, building toward a proper knowledge of the dangers with which we are surrounded and the most effective way with which to combat them—carefulness.

## Des Moines Men Receive Increase of Five Cents

An increase of 5 cents an hour over the present maximum hourly wage of 54 cents, group insurance for the men and their families and a pension agreement were granted the employees of the Des Moines City Railway by the board of arbitration headed by the Rev. John T. Noonan. The decision of Father Noonan was signed by both of the other arbitrators, the Rev. Frank W. Mutchler, for the union, and W. C. Harbach, for the Des Moines City Railway.

Granting of the 59-cent wage comes almost three months from the date of the union's presentation of a demand for an increase of 26 cents an hour. The new wage agreement is retroactive to March 1, the date of expiration of the old contract.

Acceptance of the arbitrator's award by the union is regarded as a foregone conclusion, the Rev. Mutchler, having concurred in the report by affixing his signature. The hesitancy of the union to accept the Owen award a year ago resulted from the refusal of J. B. Wiley, business agent of the union, who was acting as the street car men's arbitrator, to sign the report.

Des Moines car riders face an 8-cent fare, perhaps inside of thirty days, as a result of the award. The award means that practically $25,000 in a lump will be taken from the stabilizing fund which is now only $37,000 above the minimum necessary to maintain 7-cent fares. With this deduction there would be left in the fund only $12,000 above the minimum fund of $100,000.

The company's monthly reports for February and March showed an average monthly deficit of $8,000. With a pay increase of $12,000 a month the stabilizing fund will fall below the $100,000 mark this month, automatically bringing a return of 8-cent fares.

## Court Upholds Right of Springfield Council to Ban Jitneys

Leaders of the bus men of Springfield, Mass., recently announced that operation of the buses would cease pending ultimate decision of the controversy arising from the ban placed on jitneys by the Transportation Board. The decision of the Transportation Board followed conviction on May 20 of two jitney operators in police court on a charge of operating buses for hire without a license. Richard Talbot, counsel for the bus operators, said that he expected to take the case to the Supreme Court.

A test case was made of independent bus operators in Springfield following condemnation and banning of this type of operation. On May 1 buses were banned, but Thomas M. Brunton and

George Mallis continued making their runs after their licenses had been discontinued. The operators were accused on two counts. The first complaint was thrown out. It alleged a violation of the city ordinance by operating without a license between fixed termini. However, the operators were found guilty on the second count. This was based on the statute forbidding the operation of buses for hire without a license in a manner similar to that of street railways. On this point Judge Wallace Heady in the District Court found sufficient evidence for convicting them of operating "for hire" no matter if the revenue received did not constitute their only or chief object in operating.

Judge Heady's decision defended the right of the licensing board of the city government to refuse the jitney men a license. He said that controversies between individuals and the lawful public authorities could not be settled by countenancing lawless and forbidden acts of the individuals in the public streets. To attempt to continue operation of the buses, he though, was akin to anarchy. The court went into detail on the term "for hire," declaring that compensation or reward was one of the motives as well as one of the very considerable results of the operation. Mayor Leonard said the decision was not a question of personalities but of a principle which involved all the people.

## Cincinnati Men Vote Down Renewal of Wage Contract

Members of the carmen's union voted down on May 15 a proposal submitted to them by the Cincinnati Traction Company, Cincinnati, Ohio, for a renewal of their present wage scale. The proposition, which was submitted to the union several weeks ago by W. Kesley Schoepf, president of the company, lost by a majority of fifty-eight votes. A total of 1,164 votes was cast, of which 611 were recorded against the proposition. The matter now goes to arbitration. The existing contract, which was made last year for one year's duration, expires June 30. The highest scale of pay for platform men is 53 cents an hour, with 7 cents an hour more for one-man car operators.

In submitting his plan for a renewal of the present working agreement unchanged for three years, President Schoepf advised them to consider also the worth of a rather long-time wage contract because of the uncertainty of economic conditions and that they were voting their opinions regarding it. The fact was pointed out that coal miners and other union labor organizations had acted favorably on proposals of contracts for a longer period than one year.

Under the terms of the existing contract between the Cincinnati Traction Company and the union, should either desire to "open" the contract it is necessary to give a thirty-day notice prior to July 1. Because of the negotiations of the traction company with the city for a new or an amended franchise the officers of both the union and the traction company consented to go into conference some time ago rather than wait for the usual time.

## Bus Service Begun Between Vancouver and New Westminster

De luxe motor buses began operating between Vancouver and New Westminster under the name of the B. C. Rapid Transit Company, a subsidiary of the British Columbia Electric Railway, on May 1, five Fageol buses and one White bus being used. The distance between the two cities is 12½ miles and a fifteen and twenty minute service is being given.

The British Columbia Electric Railway operates an interurban line on its own right-of-way between the two places, charging 35 cents return fare. The new bus line charges 35 cents one way and 60 cents return, but it has been well patronized from the start in spite of the higher fare.

On beginning operations the B. C. Rapid Transit Company took over the Blue Funnel Motor Line, a jitney service which has been in existence for about ten years. Thomas D. Coldicutt, manager of the Blue Funnel Motor Line, is now traffic superintendent of the B. C. Rapid Transit Company.

Previous to the Blue Funnel Motor Line being taken over a number of the drivers owning cars and operating in conjunction with this line broke away and formed their own organziation, known as the Westminster Motor Line. A rate war then started, both jitney lines cutting the fare to 25 cents return, which fare is now continued by the Westminster Motor Line, operating some eighteen jitneys.

In spite of the lower competitive fare the B. C. Rapid Transit buses are being well patronized, the public gladly paying the additional fare for transportation in a superior vehicle run by a substantial operator.

The new buses terminate at the interurban stations of the British Columbia Electric Railway in Vancouver and New Westminster. As considerable revenue is derived from parcel express, arrangements had to be made to take over this business. All shippers in Vancouver and New Westminster were notified in advance of the new service.

Previous to starting operations the full equipment of buses was paraded through the business streets of Vancouver and New Westminster so as to obtain the best advertising possible for the new service.

## Six Killed and Twenty-four Injured in Indiana Wreck

Five persons were almost instantly killed, one died of shock and twenty-four others were injured, two seriously, when the Wabash Valley Flyer, a crack Indiana Service Corporation train between Fort Wayne and Indianapolis, and an extra trail train collided at a curve inside the town limits of Roanoke, north of Fort Wayne, on Monday evening, May 19, at 6 o'clock.

Three separate investigations of the tragedy were under way on May 21 by the Interstate Commerce Commission, the Public Utilities Commission and the local authorities. It is expected that next Monday, May 26, a joint session will be held in an effort to fix responsibility for the fatal crash.

Coroner J. W. Good of Huntington County began an immediate investigation. He places tentative blame for the tragedy on the crew of the eastbound extra train, which is believed to have over-run orders to meet the flier at Mahon, nearly a mile west of the point where the cars crashed.

Robert W. Feustel, president of the Indiana Service Corporation, in a statement issued on May 21, said that the eastbound crew was to blame for the tragedy and expressed the belief that this would be shown definitely at the coroner's inquest.

Motorman Frank Nolna, of the extra train, was seriously injured, but it was expected he would be able to testify on May 23 before both the coroner's body and the joint meeting of the Interstate and the Public Service Commissioners.

Both wrecked cars were destroyed beyond all hope of repair. They were built of wood. The Indiana Service Corporation recently laid out a program of steel car construction, and a greatly enlarged part of the company budget during the coming year will probably be applied in furthering this plan of substitution, as a result of the tragedy.

## Railway Reported to Be After Bus Line

J. K. Newman, representing the reorganization committee of the United Railways, St. Louis, Mo., conferred recently in Chicago with John Hertz, president of the Chicago Motorbus Company, who also is interested in the People's Motor Bus Company, St. Louis, regarding the possibility of arranging to include the St. Louis bus lines in the new company which will be organized to succeed the United Railways when the receivership of that company is lifted.

The competition of the bus lines is not unduly severe, but the bus company has applications pending for eight new lines.

Mr. Newman is reported to have made the following statement:

> Buses are a necessary part of any large transportation system. It is self-evident, however, that if they operate as competitors of the railways, fares on the railways cannot be lowered to the level that would be reached if bus profits went into the treasury of the railway system.
>
> People want buses and they should have them. If a man wants to pay 10 cents to ride home in a bus he should have that privilege. The reorganization plan contemplates satisfying that demand, but if the buses are competitors, they reduce railway traffic materially. If the buses operate in conjunction with the railway the profits of the buses could be thrown into the railway treasury and make up for the loss in traffic. It would mean in the end lower fares.
>
> I do not mean that the buses if coordinated with the railway would not compete with the street cars. They would. But the receipts would go to the same pocket and a reduction in street car traffic would mean an increase in bus traffic. The volume would be the same.

While it is known that the reorganizers of the railway would prefer to purchase the People's Motorbus Company outright, it has been intimated that Mr. Hertz and his associates might be invited to become financially interested in the railway and operate the bus lines as an auxiliary to the street cars.

Charged by the court with the responsibility of conserving all the resources of the railway, the receiver has been prevented from establishing bus lines.

## Rehearing Held on Santa Monica Bus Franchise

Acting upon a petition of some 1,500 protestants, the California State Railroad Commission held a rehearing on May 8 on the application of the Pacific Electric Railway for a bus franchise on Pico Boulevard from the terminus of the Los Angeles Railway's local Pico Boulevard car line in Los Angeles to the city of Santa Monica.

Several months ago applications of the Pacific Electric Railway, Bay Cities Transit Company, United Stages, Inc., and D. G. Henderson were before the commission for a bus line permit on Pico Boulevard, which connects Los Angeles and the Santa Monica Bay district. At that time the Pacific Electric Railway was granted the bus franchise. After the franchise was granted Mayor Steele of Santa Monica joined in a petition to the commission protesting against the granting of the franchise to the railway, claiming "excessive and unreasonable rates of fare were proposed to be charged." The petition was also presented to the City Council, Board of Public Utilities and Mayor of Los Angeles, asking the city of Los Angeles to join with Santa Monica and oppose the railway.

In the petition it was alleged that the Railroad Commission had no jurisdiction and was without authority in law to grant a bus transportation franchise on Pico Boulevard within the city of Los Angeles. The petition further alleged that the schedule of fares of the rail line was in excess of the bus fares proposed to be charged by the other bus lines that made similar application for the franchise.

The commission explained its stand in the matter of the bus permit granted the Pacific Electric and declared the provision whereby the commission could order the Pacific Electric to extend its line from Santa Monica to the terminal of the Los Angeles Railway line on Pico Boulevard in Los Angeles had an important bearing on the granting of the permit. Commissioner Shore, who presided over the case, stated that the commission regarded buses as auxiliary feeders for rail lines. Mayor Steele said his protest was based chiefly on the high rates, stating that the Bay Cities Transit Company, which operates the bus system in Santa Monica, could offer more reasonable rates.

At the rehearing on May 8 it was claimed by counsel of the Bay Cities Transit Company that if it was given a permit for the Pico Boulevard bus line the company would put on three or four buses, and that when they paid for themselves additional buses would be operated to meet public demand. The Bay Cities Transit Company's application, denied at the previous hearing, was due to lack of proper financial backing, Commissioner Shore stating that $40,000 in cash and $100,000 at the end of the first year's operation would be required of the operating company that was given the certificate.

The Bay Cities Company proposed a method of financing the operation of the proposed bus line by incurring indebtedness, which was different from the commissioner's suggestion, who stated he could not consider any proposition of financing bus operation on Pico Boulevard which did not show the qualities of a substantial certainty. If the Bay Cities Company's petition is denied its counsel threatens to carry the case to the Supreme Court.

The Pacific Electric Railway now holds the certificate to operate over the Pico Boulevard route, but execution has not been made final, pending the outcome of this rehearing. The commission is expected to decide the matter during the next few weeks.

## Ninety-five-Cent Pass in Washington, Pa.

Inviting its patrons to join the Washington Unlimited Ride Club, the Pittsburgh Railways put into effect on May 19 an unlimited-ride, fully transferable weekly pass to be sold at 95 cents for use on local cars within the city of Washington and East Washington. The cash fare of 6 cents remains. Washington, a flourishing industrial and educational community of 30,000 or more is the terminal city of the Pittsburgh-Washington interurban division. In one of its advertisements on the new pass the company urges the purchaser to bear in mind that for 95 cents he will from Monday morning to Sunday midnight need no change, need no transfers, be free to ride any number of times, be free to transfer his pass to another and make his fare as low as he pleases, just by making greater use of the cars. The company has installed fare boxes to aid in the collection of cash and ticket fares, but no change will be made in the method of accounting for these. The company explains that the purpose of the passes is simply to reduce the number of transactions due the various classes of fares. A great deal of poster and other advertising matter pertaining to the new plan accompanied its installation.

## Buses Will Replace Trolleys in Plainfield

All lines of the Public Service Railway in Plainfield, N. J., are to be abandoned excepting the Union line, which runs through Bound Brook, Elizabeth and to Newark, N. J., according to an agreement entered into May 12 by the City Council of Plainfield, the Public Service Railway and the Public Service Transportation Company. Buses are to be substituted in lieu of the trolleys and the tracks of the Fourth Street line, the Arlington Avenue and the Netherwood lines are to go. The agreement also establishes a 5-cent fare within the city limits on both the buses and the trolleys remaining in service, but with no provision for transfers. The railway retains its franchise rights in the streets affected under the terms of the agreement, the maintenance of service by means of buses being construed as a fulfillment of the franchise obligations. The bus permits are to be for one-year terms. The transportation company which will operate the buses now has seven vehicles in operation and will install more in the near future. As each line is organized and equipped to handle the traffic, the tracks will be taken up.

## Will File Improvement Plans for Brooklyn "L"

The Brooklyn-Manhattan Transit Corporation will send to the Transit Commission for approval plans for steel guard rails which will be installed immediately on the Myrtle Avenue elevated and part of the Fulton Street lines. This, however, is only a beginning. The company expects to replace the present wooden inside guard timbers on all of its elevated structures, as rapidly as it requires replacement, by substituting steel rails. The company will also send plans to the commission for additional bracing for the Fifth Avenue line near Fourth Street, Brooklyn.

When these plans are approved by the Transit Commission the B.-M. T. will have carried out, or will have made complete preparations to carry out, all the major recommendations recently made by the joint committee of engineers representing the city, the Transit Commission and the company, after their thorough inspection of the structures, cars and tracks of the elevated portions of the company's rapid transit lines.

## New York's Mayor Suspicious of Railway's Bus Proposal

Mayor Hylan of New York at a meeting of the Board of Estimate on May 16 admitted that, in certain conditions, he was prepared to vote for a plan submitted by the Fifth Avenue Coach Company, even though that would involve a 10-cent fare, instead of a nickel.

Representatives of the Third Avenue Railway and of the Fifth Avenue Coach Company, operating the buses on Fifth Avenue, presented plans for a bus transportation line extending along the Concourse from 138th Street and Mott Avenue to the northernmost limit of the Concourse, including spurs and side lines to serve the more thickly populated areas adjacent to that thoroughfare.

The Third Avenue Railway offered a universal system of transfers between the new buses and the company's trolley cars operating in Third Avenue. Of this proposition the Mayor said:

> You don't need to make any proposal here. Neither the Third Avenue Railway, nor the I. R. T., nor the B.-M. T. can put anything over on us. Even if you offered to let the Bronx people ride free, I should vote against your proposition, for I should be sure there was some trick in it. You can't get anything here during my administration. Your plan of a universal transfer is just another scheme to fool the people. I will vote against your proposal on general principles.

When the application of the Fifth Avenue Coach Company came up for consideration, Mr. Wood, its general manager, said his company would be satisfied to undertake the task on a temporary permit for ninety days, revocable at any time after that at sixty days' notice.

Representatives of the Third Avenue Railway prevailed upon the Mayor to permit them to place their Bronx bus plan on the calendar in the form of a petition. Then, on the Mayor's recommendation, all the applications went over for action in committee at a later date.

## New York Men Reject Suggestion of a 5 per Cent Wage Cut

Employees of the Interborough Rapid Transit Company, New York, through their delegates, unqualifiedly rejected on May 20 the appeal of the management that they accept a 5 per cent cut in wages. In fact, the delegates unanimously countered with a demand for a 20 per cent increase in pay. The executive committee of the brotherhood is not scheduled to meet again until June 3.

Frank Hedley, president of the company, in a letter to employees on May 19 in regard to his request for a 5 per cent decrease in wages, called the attention of the men to the fact that the average wage paid by the Interborough is higher than the weekly wage paid in representative manufacturing establishments in either the city or the whole state as reported by the Industrial Commission of New York. Answering the question as to how the road can keep going when it is not earning enough to pay expenses, taxes and interest, Mr. Hedley said:

> We have not been able to meet our payments as they became due and we have been obliged to put some of them off in the hope of better times. We are behind in the payment of our undisputed taxes to the extent of about $968,000. Of late we have been compelled to go rather slowly in the matter of prompt settlement for injuries.

Mr. Hedley pointed out the following facts for the consideration of his men:

1. Earnings are not enough to meet expenses, taxes and interest on borrowed money.
2. Cash on hand is not enough to pay off deferred taxes, claims and similar items.
3. If you consent to go back to the rate of last year, we shall probably just about break even during the year commencing July 1, 1924.
4. After you take off this year's 5 per cent increase the average wages will still be ahead of the increase in the cost of living, and greater than the average wages paid in most of the industries in the city and state of New York and more than the average wages paid in cities where they have an increased fare.

Mr. Hedley asked the men to consider these facts in making up their minds as to whether his request for wage reduction was not fair and reasonable.

## Bus Competition of York Railways Ordered to Stop

The Pennsylvania Public Service Commission recently ordered John H. Longstreet, a bus operator, and his agents to cease operating motor vehicles as common carriers within the Commonwealth of Pennsylvania until they had obtained from the commission a certificate of public convenience. The bus has been operating since October 1, 1923.

Following the refusal of the York Railways to extend city service to a real estate development, known as East York, approximately 1 mile from the end of the Market Street line, the real estate operator placed in operation on a thirty-minute schedule a twenty-one-passenger bus called a "Community Bus." The route of the bus paralleled the tracks of the York Railways from East York to Centre Square, York, a distance of 2½ miles. On the outside of the bus was lettered "Maintained by voluntary contributions."

It was the contention of the operator that he did not need a certificate of public convenience, claiming that he was not charging a fare or operating for profit. The railway entered a protest before the commission and on May 3 last received a favorable decision.

The commission ruled that the circulation of cards reading "Don't ride in the trolley cars, wait for the bus, give away a nickel—save 2 cents" forced one to the conclusion, in the light of the complainant's 7-cent fare, that the purpose was to enter into a regular-scheduled competitive service with the railway company. The commission also stated that the fact that the bus operator received passengers at any point along the route completely nullified the conception of an engagement in private carriage for the benefit of the residents of a given community.

## Routing Cars Around a New Merchandising Loop

All the town sat up and looked surprised when Herpolsheimer's store in Grand Rapids bought free transportation for the public from the Grand Rapids Railway, Grand Rapids, Mich. It's one thing to charter a score of cars to give the orphans an outing or carry a Sunday school picnic to the boats or to boost the ball game, but the instances are isolated where the cars have been called into play by the retailer to direct a stream of shopping to a special merchandise event. Yet this is just what Herpolsheimer Company, a large department store in Grand Rapids, did April 30 to celebrate with all due honors its fifty-fourth anniversary sale during May.

An agreement was reached between the Grand Rapids Railway and this large store whereby every street car in the system would carry people downtown between 9 and 11 a.m. on a stipulated day, at the expense of the Herpolsheimer Company, and this was broadly advertised as an anniversary feature.

The day previous each car bore a sign on the front which read "Ride Free to Herpolsheimer's—54th Anniversary Tomorrow, 9 to 11 a.m.," while on two windows of each car appeared a card reading "Free Ride on This Car Friday 9 to 11 a.m. Compliments Herpolsheimer's—54th Anniversary." Over the mouth of the fare box was placed a hood which explained "Free Ride Courtesy Herpolsheimer's—54th Anniversary."

A double-page newspaper announcement told of scores of special offerings just for a three-hour period from 9 to 12 a.m. This spread showed by comparison of old and new types of cars the rapid progress of the local railway since the days when Herpolsheimer's began business. Crowds availed themselves of the opportunity to join in the celebration and the close co-operation of the railway officials, the staff and the store helped every phase of the plan, drawing compliments from the shopping and traveling public.

Store officials declared that, regardless of their destination, Herpolsheimer's enjoyed having people make use of the cars freely with its compliments, since it was its birthday and the treat should naturally be on the store.

## Agitation for Staggered Hours Being Heeded

Managers of fifteen theaters in New York recently decided to conclude their performances on matinee days at 4:40 p.m., so as to make it possible for their audiences to use the various transportation lines before the height of the rush hour. This action on their part is entirely voluntary. The desirability of an arrangement of this kind has been stressed on several occasions by the New York Transit Commission, and during the severe snowstorm of Feb. 19 officers of the commission got into touch with large employees of labor principally through the Chamber of Commerce and urged the early dismissal of forces so as to relieve traffic congestion.

The action of the theater managers is in keeping with that of several business concerns that have voluntarily adjusted the working hours of thousands of employees so as to bring them to their offices ahead of the peak rush in the morning and to send them on their way homeward ahead of the evening maximum loads.

In commenting on the action of the theaters Commissioner Harkness said that the difference should be particularly noticeable on Wednesday and Thursday afternoons, particularly in the winter season, when all traffic upon the subways, elevated railroads and surface car lines is at its maximum. The addition, just at five o'clock or a few minutes after, of the thousands forming the matinee audiences in the theater districts has been a serious tax upon the transit facilities. The situation upon Saturday afternoons has been almost as bad, but has been mitigated slightly, however, by the fact that the Saturday half holiday, which now so generally prevails in many trades and professions in New York, has lightened the late Saturday afternoon traffic to some extent.

Working along similar lines, P. H. Woodward, general passenger agent of the Long Island Railroad, has urged a general readjustment of Manhattan's business hours as a palliative for the commuter congestion on railroads into New York. The Long Island road is taking the initiative in an effort at readjustment. Its employees are largely commuters, riding free but filling space just the same. The working hours of hundreds of employees are being changed from 9 and 5 to 8:30 and 4:30.

## Approves Requests for Intracity Increases

In filing its formal appearance with the Indiana Public Service Commission on May 16 in the cases of the Fletcher Savings & Trust Company, Indianapolis, as receiver for the Beech Grove Traction Company and the Union Traction Company, as operator of the Broad Ripple line in Indianapolis, the city corporation counsel approved the requests of the companies for increases in the intracity fares to be equal to the 7-cent fare granted the Indianapolis Street Railway. The Beech Grove line proposes to sell four tickets for 25 cents, just as the railway will do. The Union Traction Company does not make any such proposal and the corporation counsel said he believed it should be required also to issue tickets at that rate. A movement is on foot to cut the fares for school children on all intracity lines.

## General Fund Not Available to Pay Seattle Tax

Court action, with the city of Seattle as defendant, impends as the result of Corporation Counsel T. J. L. Kennedy's opinion on the street railway tax agreement, by which the city was to pay three-fourths and the Puget Sound Power & Light Company one-fourth of the 1919 taxes on the Seattle Municipal Railway. The Corporation Counsel now rules that the city has no legal right to draw on either the general fund or the street railway department for the money wherewith to pay its share of the 1919 railway property tax, and that the city is without authority to issue bonds for the purpose of meeting the payment. The Corporation Counsel also holds that the City Council, in agreeing to share payment of the tax, exceeded its authority.

As a result, the Council, meeting in a committee of the whole, has instructed the city clerk to notify A. W. Leonard, president of the Puget Sound Power & Light Company, that the city will not voluntarily pay any part of the 1919 tax. The Council has been advised that if the county treasurer is forced to proceed in distraint in the case he can act only against the power company, as the railway property appears on the assessment rolls in 1919 as company holdings.

Mr. Leonard, in a letter to the Council, urged the payment of the city's share of the taxes. Corporation Counsel Kennedy, however, held that the tax cannot be paid from the general fund because the tax was included in the original purchase, and not incurred later; that it cannot come from the railway revenue fund, because of statute prohibition, and because of the outstanding indebtedness against the railway at present; it cannot be raised by bond issue, he asserts, because provision for bond issuance was not included in the original purchase ordinance.

## Relic Uncovered in Grand Rapids Street

The Grand Rapids Railway, Grand Rapids, Mich., in constructing new track in the downtown section, encountered what proved to be a novel but formidable problem in preparing the excavation. The obstacle was an old cable conduit.

The cable road was an episode in the history of Grand Rapids of more than thirty years ago. The company expected the excavation would be an easy job with electric drills and a steam shovel, but the conduit had to be broken up by battering ram methods and then carted away in fragments—a slow and costly process.

The conduit was in as perfect form as when it was built. The steel forms were somewhat rusted, but the construction still would have been serviceable if Grand Rapids were to return to the cable road methods.

## Illinois Company Will Make Wage Overtures

A committee named by the street railway employees' local, No. 313, of Illinois, to negotiate with the Tri-City Railway on a new wage contract beginning in June, has left the matter of a wage scale entirely in the hands of the company officials with a recommendation that an increase be granted and that the first offer be made by the company. This move, which became known in union circles, is different from the course that has been followed in recent years, when negotiations of a wage agreement were being held between the railway company and its employees. It was explained by union officials that if the offer of the company is unfavorable, then a board of arbitration will take charge of the controversy. The union has fixed no figure as to the increase it will ask. Working conditions have practically been agreed upon and therefore will not enter into the wage controversy, it was stated. The car operators receive 58½ cents an hour at present, while the maximum wage paid to the shopmen is 68½ cents. The agreements of the railway employees expire at midnight May 31.

It became known that the employees of the Iowa division of the Tri-City Railway will handle the wage negotiations with the traction company in the same manner as on the Illinois side. The Iowa operators and shopmen also ask more wages, but have not fixed a definite amount for the increase, giving the company an opportunity to make the first offer.

## Utility Measures Will Go Before California Voters in November

According to petitions being circulated throughout the State of California several utility issues will probably come up before the voters at the ballot next November. Proponents of these measures must succeed before Aug. 5 in securing the required number of signatures.

One issue involving traffic control, and known as the franchise act, provides that the State Railroad Commission shall have the exclusive power to grant determinate or indeterminate franchises for motor vehicle transportation for compensation upon streets and highways, the same to apply to interurban and suburban railways. Another act favored is one to tax publicly owned public utilities, which provides that utilities owned by municipality, county, district or other public agency are subject to the same tax as utilities owned by corporations. Another act is proposed to regulate publicly owned public utilities, which provides that they shall be under the jurisdiction and control of the State Railroad Commission.

Two proposed state constitutional amendments are favored, one of which is known as the utility tax amendment and provides that a public utility, paying state taxes, may deduct from gross receipts from operation of its business any amount it pays to another public utility when that amount is included in gross receipts from which tax of the latter utility is computed. A municipal public works act is proposed which authorizes two or more municipalities to acquire or control by contract public works for supplying inhabitants with light, water, power, heat, transportation or other utility service.

## Application of Business Principles Responsible for Detroit Success

"Such success as has been ours I attribute, first, to our strict adherence to sound business principles and, second, to freedom from political interference. Under the Detroit charter we are responsible to nobody but the Mayor. The City Council cannot meddle. I am not prepared to say that municipal ownership is a success, even in Detroit—only time can demonstrate that—much less that it would be a success for cities of the nation at large."

The speaker was Griffith C. Ellis, president of the Detroit Street Railway Commission. He was talking about the experiment in municipal ownership in that city. He has been wintering in California and the Los Angeles *Sunday Times* recently sought him out so as to tell its readers about the situation in Detroit. Mr. Ellis said that his training as a business man led him to the conclusions shared by most other American business men—he was opposed to government ownership or, for that matter, to encroachment by government upon the functions of private business, except when absolutely necessary, and then as little as possible. Mr. Ellis is quoted in part as follows:

> Municipal ownership was undertaken by Detroit as an emergency measure. The city and the Detroit United Railways had been at loggerheads for years. The people were getting more and more exasperated, the city was being strangled for lack of adequate service, the company was getting more and more apprehensive of the future and was spending less and less money, the property was running down, and there was nothing in such a situation to attract new capital.
>
> When it was proposed that the city pay for pavement laid between the rails of the municipally owned railway, we refused to concur. In Detroit as in most other American cities, the railway always had been required to lay the pavement and we insisted that our experiment be conducted under precisely the same conditions as governed private business in the same field elsewhere. By accepting a gratuity from the city and permitting the taxpayers to do the paving, we could have saved $1,000,000 a year, but we refused on principle, and, of course, we pay full taxes.
>
> We have been censured because we carry no depreciation account. We believe in the principle of such accounts and the time is not distant when we shall open one of our own, but for the present we need all our money for repairs and replacements. Our best answer to criticism, perhaps, is that admittedly the property is now in far better condition than it was when we took it over.
>
> All repairs and replacements have been paid for out of earnings. I do not know whether we are required legally to do so or not, and it makes little difference, for we assumed that we were and we knew that if we were not we ought to be. Money raised by bond sales has been spent on nothing but extensions and the purchase of new equipment.
>
> Increased wages to platform men, awarded by an arbitration committee to which a dispute was referred, have forced us to raise fares from 5 cents to 6, with tickets sold in strips at reduced rates, which brings the average down to about 5.55 cents.
>
> We are paying the second highest wages in the country—exceeded only by New York and Chicago—and giving the second cheapest fare. Raising the fare higher would have put us in better financial position, but we chose to reimburse ourselves only for the actual loss imposed by the arbitration award.

## News Notes

**Cohoes Trackless Trolleys Delayed.**—The Capitol Transportation Corporation, formed by officials of the United Traction Company, Albany, N. Y., has received a setback in its application to operate trackless trolleys in the city of Cohoes. The residents there are not satisfied with the proposed route of operations and as yet no permit has been granted.

**Course in Utilities at Harvard.**—Harvard University, has established a course on public utilities in its school of business administration. The professor in charge will be Theodore Howard Dillon, who will have associated with him Charles Williams of the Philadelphia Electric Company.

**Seeks Increased Rates.** — The Nova Scotia Tramways & Power Company, Halifax, N. S., is seeking permission to increase its railway fares from 7 cents to 10 cents.

**Complaints of Trolley Delay.**—Delay of trolley traffic on Lake Street, a main artery for motorists between Minneapolis and St. Paul, Minn., by automatic semaphores has become so harassing that vice-president J. T. McGill of the Minneapolis Street Railway asked the street railway committee of the City Council to help expedite travel across street intersections where these semaphores operate.

**Who Decides Bus Permits?**—City Solicitor Gaffney of Philadelphia recently stated that a motor bus line was not a street railway referring to the act of the Public Service Commission in granting to the Philadelphia Rural Transit Company a certificate to operate a bus line in Germanstown before the City Council had granted such permission. He said that in this case the certificate granted was only a temporary one. He stated further that a case will be brought up before the Superior Court shortly involving a bus company in Chester procuring a certificate and beginning operation without a franchise from the municipality. A second company appeared and secured a certificate from the City Council, but had no sanction of the Public Service Commission. The question which the court will decide is which of the two companies has the right to operate.

**Pays for Paving.**—Carrying out the provisions of the contract agreement for the reorganization of the Pittsburgh Railways, Pittsburgh, Pa., Arthur W. Thompson, president of the traction company recently transmitted two checks, a total of $75,000 to C. K. Robinson, special assistant city solicitor in charge of public utilities litigation, as the first quarterly installments for street repaving work and for bridge toll and pole tax. The payments were divided into two items one of $50,000 and a second for $25,000. Under the provisions of the contract agreement, the company will pay the city $200,000 a year in quarterly installments to finance the cost of street work between the railway tracks. Another provision of the contract stipulates that as a substitution for all bridge tolls, pole tax, car tax, etc., the company shall pay the city $100,000 a year in quarterly installments.

**Pays Its Share of Paving.**—Instead of contesting the right of the city of Pottsville, Pa., to compel it to pay a part of street-paving costs where its tracks are located, the Eastern Pensylvania Power & Light Company recently announced it would pay its full share. Last year the company protested against being compelled to pay these costs.

**Decrease in Accidents.**—The Morris County Traction Company, Morristown, N. J., reports a decrease of 51 per cent in accidents in April, 1924, compared with April, 1923. During April a year ago 60 per cent of the cars were two-man operated and in April, 1924, all the cars were operated as one-man cars. On the main line, on which one-man operation was started on March 23, 1924, the company reports a decrease of 42 per cent in the number of accidents over a similar period during 1923.

**Ohio Property Starts Bus Operation.**—The Columbus, Newark & Zanesville Electric Railway, Zanesville, Ohio, has received the first of its new bus equipment for use on the Ridge Avenue route. The two new Fageol coaches ordered cost in the neighborhood of $9,200 apiece. The buses will be run to the Kearns-Gorsuch plant and will relieve congestion that has been felt there in the past.

**Seeks Increased Fare.**—The Texas Electric Railway, which operates the lines in Waco, Tex., has petitioned the City Commission for authority to increase the fare in Waco from 5 cents to 7 cents with four tickets for 25 cents. Before the petition was submitted to the City Commission, the matter of increased fares was placed before a meeting of the stockholders of the line, held in Waco and presided over by Jack Beall, Dallas, president of the Texas Electric Railway. Mr. Beall submitted to the meeting of stockholders a statement of the financial condition of the property and declared that service could not be maintained at its present standard under a 5-cent fare. The president declared that he believed the company entitled to a 7-cent fare with a 3½-cent rate for school children. He said the proposed extension of the line to the Bellmead shops and railway yards of the Missouri, Kansas & Texas Railway Company could not be undertaken unless the 7-cent fare was granted.

**Want Center Curbing and Poles Removed.**—An ordinance providing for the removal of the curb and trolley poles of the United Railways in the center of Delmar Boulevard from King's Highway to Clara Avenue has been presented to the St. Louis Board of Aldermen by the Director of Streets and Sewers, Clinton H. Fisk. The center curbing separates the street cars from the vehicular traffic along Delmar Boulevard and has been a decided advantage to the railway in the movement of its cars. The curbing inclosed a strip 32 ft. wide and the company has established wooden platforms for the convenience of patrons desiring to get on and off cars. These platforms have served as safety zones for pedestrians menaced by speeding automobiles. However, autoists claim that the parked right-of-way of the street cars prevents a free movement of automobile traffic and that the poles in the center of the street are unsightly.

**"The First Electric Railway."**—The papers, of Binghamton, N. Y., during the week ended May 17 carried a picture of Binghamton's first trolley car in 1886. The occasion was a controversy in the New York *Herald-Tribune* as to when the first electric car was operated in the United States.

**Bus System Refused.**—The Public Service Commission recently issued an order denying the petition of the Washington & Rockville R.R., Washington, D. C., for permission to substitute a bus system on the Silver Spring end of its line. At the same time the commission granted permission for the use of one-man safety cars on the line provided the tracks are lowered at Silver Spring to eliminate the grade crossing. This means the railroad will have to pay the $17,500 demanded by the state roads commission as its share of the expense of the elimination of the grade crossing at Silver Spring. The company notified the commission it was willing to pay $12,500 as a fair proportion of the cost. The commission has received assurance that a number of residents of Silver Spring will buy bonds of the company, which will be used to make up the difference between what the company is willing to pay and what the State Roads Commission demands.

**Company to Assume Loss.**—The St. Paul City Railway, St. Paul, Minn., has assumed liability for repayment to employees of $44,000 savings funds deposited to their credit with the Capital Trust & Savings Bank, which was closed by the state department of banking. This money represents a monthly deduction of 2 per cent from the pay of each worker for a long period. Horace Lowry, president, said it was only right that the company should assume the liability and guarantee repayment on demand. The company selected the bank and will take over a proportionate amount of the assets and shoulder any loss that may result from the liquidation.

**Would Limit Bus Franchise Ten Years.**—To obtain a bus ordinance against which no reasonable objections could be raised, Charles B. Hall, president of the City Council of Philadelphia, Pa.; Chairman Walter of Council's committee on transportation and public utilities, and City Solicitor Gaffney recently discussed amending an ordinance, now before the Council, granting the Philadelphia Rural Transit Company a franchise for a city-wide system of motorbuses. It was decided to recommend to the Council an amendment whereby the life of the proposed franchise would be limited to ten years. In addition to the change in tenure for the franchise, another change agreed upon would provide for a fee of $50 for every motorbus to be paid to the city. Coleman J. Joyce, counsel for Philadelphia Rapid Transit Company, said he would submit the proposed amendments to his company.

# Foreign News

## Chain of Tourist Hotels Planned by P-L-M

*Le tourisme* is a business in France. There is not a single element catering to the traveler today but what is developing its tourist business by the inauguration of electric railway feeders and motor buses and stages in natural and historic sites throughout the rhomboid of modern France. In the forefront of the movement is the Paris-Lyons-Mediterranean Railway, the first trunk line to inaugurate long-distance tourist routes by motor bus and electric railway in the Alps. Next in order follows the Midi Railway in the Pyrenees districts and the State Railways in the famous historic forest regions of the Ile de France, immediately surrounding the capital.

Besides the formidable Route des Alpes itinerary from the Mediterranean to Lake Geneva and to Mulhouse, the circuits of the Forest of Fontainebleau and Avignon and the Ardech, the railway is fathering a series of stop-over hotels available for tourists at the end of each day's run. The project is still in the paper stage but, following in the footsteps of the Compagnie Generale Transatlantique in Morocco, a chain of what may be called "motorbus hotels" is soon to come into being. The capital set aside by the railway for the purpose is 12,000,000 francs, and the president of the subsidiary company is Monsieur Stephane Derville, president of the board of the P-L-M Railway.

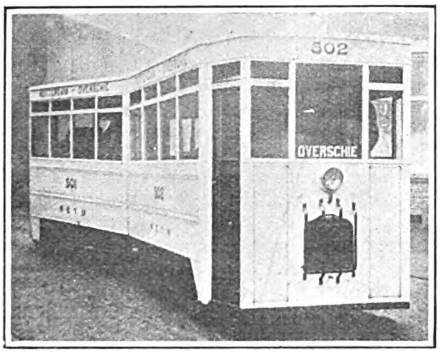
## Paris Car Tracks May Be Removed

The Paris, France, Prefecture of Police, which regulates street traffic, is preparing to issue new regulations, which will result in a whole new layout of street car traffic in the near future. So far as possible it has been deemed desirable for aesthetic reasons to keep the street cars off the more imposing boulevards and avenues. This has resulted in placing car lines on some of the most crowded thoroughfares of the city, although there are tracks on many wide streets and boulevards. Weaving their way through side streets to central points like the Opéra, the Madeleine and Saint Germain des Pres, they have proved a drawback to rapid movement of other street traffic. It is now proposed to terminate these lines at what may virtually be called the belt of the outer boulevards, taking into consideration that the five great railway stations must perforce have direct connection. From these points, none of which is more than half a mile from the Opéra quarter, accelerated service will be run to the immediate suburbs as at present. The chief relief is looked for in the Rue Reaumur and the Rue du Quatre Septembre.

Since the street car lines are now a part of the Transports en Commun, which comprises all local transportation facilities in the city, there may be no loss in revenue to the company as a whole. The change will mean an increase in bus lines and increased traffic on the various subways, of which new short connecting links are being opened.

## Articulated Car Shows Speed to Hollanders

The street car pictured on this page accommodates from twenty to thirty persons (assuming that some of them stand) and, being built in two sections, can negotiate short turns easily. The correspondent says that a Ford motor in a Dutch car is an experiment that promises to be highly successful, as Ford motors have shown a tendency to supplant other varieties in Rotterdam and elsewhere. The JOURNAL is getting further information.



Car with a Ford Motor Operated in Rotterdam

## More London Tube Extensions

It is reported that the contract has been let for the construction of the tunnels for the extension of the Charing Cross & Hampstead Railway from Charing Cross to a junction with the City & South London Railway at Kennington, a distance of about 2 miles. The cost of the tunnel work is put at about £400,000.

On May 3 it was announced that contracts had been settled for the driving of the tunnels of the City & South London Railway southern extension from Clapham Common to Morden, a distance of about 5 miles. The price is about £600,000. The cost of stations, rolling stock, etc., will bring the total up to about £3,500,000.

These two extensions and the prolongation northward of the Charing Cross & Hampstead Railway to Edgware (now under construction) will complete the major part of the underground railways developments at present authorized.

If the contractors complete their work in the fifteen months allotted, it will be the quickest piece of tube tunnel driving yet accomplished. To insure that the work is done on schedule time, ten rotary excavators will be employed, each having a forward drive of 15 ft. to 20 ft. per day. The total weight of cast-iron segments for lining the tunnels amounts to 60,000 tons. There will be seven stations, all equipped with escalators. The population served by the extension is about 300,000 and it is estimated that it will carry 50,000,000 passengers annually.

The City and South London Railway is now linked up with the Hampstead line by a new tube extending from Euston to Camden Town, a distance of a mile. The section from Euston to Moorgate has been entirely reconstructed and the Underground began through train service between Hendon, Golder's Green, Highgate and the City on April 20. The whole of the work was accomplished without interruption of the normal services provided on the Hampstead Line.

Provision had to be made for the uninterrupted flow of traffic on six separate tube lines, which converged to a point just south of Camden Town. Flat junctions were out of the question, as during busy hours trains would have to wait for each other to pass. The difficulty has been overcome by means of "flyover" and "flyunder" junctions. The trains on each line will run in separate tunnels which rise over or pass under each other.

Ninety-six trains per hour will have to pass over the junction in all directions. The maximum capacity of the new junction is 160 trains per hour. Although work was started from several different points and altogether some seventeen connections were made between new and existing tunnels, at no point was the margin of error in calculation more than one quarter of an inch.

**Trolley Bus Not Approved for Dundee.**—Dundee, Scotland, being a city of very steep gradients, is not suitable for the adoption of the railless system of electric traction, according to Walter Young, general manager of Dundee Corporation Tramways, reporting to the tramways committee. That the tramways there could be superseded by trolley buses, he says, is unthinkable. Dundee, he continues, is well served by the tramways and will be for many years, and it would require a much more mobile vehicle than a railless car to supersede the tramways.

**War Bonus Gives Paris Omnibus Company Profits.**—The Compagnie Génerale des Omnibus de Paris, the bus section of the Transports en Commun, showed gross profit for 1923 of 18,664,356 francs, and net profit of 12,880,160 francs. The third payment and the part of the war bonus guaranteed by the municipality of Paris, as a result of the taking over and welding of all public service vehicles into a single unit, amounted to 17,537,805 francs. Accordingly the bonds show a "dividend" of 58 francs and the stock of 33 francs. The showing is considered remarkable, but it is made possible by what amounts virtually to a municipal subvention.

# Financial and Corporate

## Municipal Line Needs $987,500

### New York City Official Requests Addition to Revolving Fund for Staten Island Line

Commissioner Grover A. Whalen of the Department of Plant and Structures of New York City has sent to the Board of Aldermen a request that it adopt a resolution asking the Board of Estimate to authorize the issuance of $50,000 in special revenue bonds to replenish the revolving fund for the operation by the city of the Staten Island Midland Railway, a 32-mile line.

Attached to the application Commissioner Whalen submitted a statement covering the city's operation of the Midland lines. In it he says, in part:

> When the road was turned over to this department by the receiver its rolling-stock equipment consisted merely of four passenger cars, the prior operation having been conducted with cars leased from the Richmond Light & Railroad Company, and it was therefore necessary for the city to purchase rolling stock required for the operation.

The commissioner's statement recites the authorization of $100,000 special revenue bonds for the revolving fund approved in 1920 and 1923 and continues:

> In addition to the moneys already expended by the city for replacements and betterments on other than rolling stock on the Midland trolley lines, it is estimated that an expenditure of $987,500 will be necessary for renewal of tracks, new cars and for repairs to carhouses if the city is to continue the operation for any considerable time, but with such expenditure it is estimated that safe operation would be assured for from five to ten years.

The statement includes a table showing total investments by the city, including the revolving fund, of $450,000.

The statement continues:

> In addition thereto a considerable amount of work was done for the betterment of the railway, and these items are carried and charged to the capital account, being a first lien on the property of the Staten Island Midland Railway.

A summary of the betterments follows:

| | | |
|---|---|---|
| Rehabilitation of overhead line and signal systems | | $37,512.88 |
| Rehabilitation of track and roadway | | 74,201.80 |
| Rehabilitation of building and structures | | 45,863.41 |
| Rehabilitation of sub-station equipment | | 9,435.29 |
| Rehabilitation of receivers' cars: | | |
| Passenger | $543.68 | |
| Service | 957.65 | |
| | | 1,501.33 |
| Reorganization of road | | 15,023.93 |
| Total betterments | | $183,538.64 |

The commissioner says that in accordance with the agreement entered into with the receiver of the Staten Island Midland, the following accounts were set up on the books, being a charge against operating expense:

| | |
|---|---|
| To take care of taxes | $57,139.88 |
| Interest (5 per cent per annum on investment) | 46,279.67 |
| Total | $103,419.55 |

Up to June 30, 1923, the commissioner explains, there has been set aside for depreciation reserve the sum of $22,000. For the period subsequent the engineers of the department are now revising depreciation charges and upon their report there will be set up the revised charges. The statement concludes:

> There is as of March 31, 1924, unvouchered bills for power amounting to $32,018, and for materials, supplies, etc., amounting to $10,500.
>
> It will be seen that it is now necessary to apply to the Board of Aldermen and to your board for a further issue of special revenue bonds to meet the expenditures of operation if the operation of the Staten Island lines by the city is to be continued.
>
> It should be stated—and it is gratifying to note—that a comparison of revenues shows an increase of 10 per cent in receipts for the year 1923 as compared with the year 1922.

## $124,838 Net for Toronto Municipal Line

The report of the Toronto Transportation Commission, the second to be issued since the city took over the system of the Toronto Railway, shows the total revenue for 1923 as $11,852,334, and the net $124,838. The income available for fixed charges was $3,747,654, allocated as follows: Interest and sinking fund on capital account, $2,387,725; depreciation $877,090; reserves of unredeemed tickets, workmen's compensation, public liability and contingencies, $358,000; leaving a surplus on the year's operation of $124,838.

The expenditure covering extensions is given as approximately $27,000,000; that for civic car lines, $2,400,000, the price of property of Toronto Railway (if the majority award is sustained), the Toronto and York Radials, and the Toronto Suburban Railway, $12,500,000; discount on debentures and expenses, $1,250,000. The total accumulated reserves are $4,137,708.

## Will Purchase Fort Wayne & Northwestern Railway

Within a short time the Indiana Service Corporation will apply to the Indiana Public Service Commission for permission to purchase the entire Fort Wayne & Northwestern Railway at an approximate price of $20,000 per track mile. The Fort Wayne & Northwestern Railway operates an interurban electric railway from Fort Wayne, Waterloo and Kendallville and furnishes light and power to several smaller towns and cities along the right-of-way.

If negotiations are concluded during the week of May 18 and permission for the sale is granted by the Public Service Commission, the Indiana Service Corporation will ask permission to issue $859,000 in bonds.

The Fort Wayne & Northwestern Railway was organized in 1905 as the Toledo & Chicago Interurban Railway, sold under foreclosure to the bondholders.

## Slight Increase in Net Income

### Baltimore Company Fell $524,000 Short of Earning Surplus Specified by Public Service Commission

After paying all operating expenses and fixed charges, including interest on income bonds, the balance of the United Railways & Electric Company, Baltimore, Md., for the year ended Dec. 31, 1923, was $1,799,356. From this was deducted $818,448 for dividends, leaving $980,907 for depreciation and surplus. During the last five years the company has spent for the items of maintenance and depreciation alone $13,914,385. During 1923 nearly $3,000,000 was put back into the property for upkeep and improvements. The Baltimore property comprises 415 miles of electric railway.

The Public Service Commission has ruled that the best interests of the

EARNINGS AND EXPENSES OF THE UNITED RAILWAYS & ELECTRIC COMPANY, BALTIMORE, MD.

| | 1923 | 1922 |
|---|---|---|
| Operating Income: | | |
| Revenue from transportation | $16,281,848 | $15,962,185 |
| Revenue from other railway operations | 179,949 | 160,406 |
| Total operating income | $16,461,799 | $16,122,592 |
| Operating Expenses: | | |
| Maintenance of way and structures | $968,245 | $917,891 |
| Maintenance of equipment | 986,679 | 913,205 |
| Maintenance of power | 40,669 | 49,014 |
| Total maintenance | $1,995,593 | $1,880,110 |
| Depreciation | 823,090 | 806,130 |
| | $2,818,683 | $2,686,240 |
| Power service | 1,312,621 | 1,223,227 |
| Conducting transportation | 5,065,084 | 4,998,870 |
| Traffic | 9,677 | 15,329 |
| General and miscellaneous | 1,433,252 | 1,514,699 |
| Transportation for investment—credit | *16,917 | *9,245 |
| Total operating expenses | $10,622,402 | $10,429,122 |
| Taxes, licenses, etc. | 1,800,335 | 1,740,512 |
| Total operating expenses, taxes, etc. | $12,422,737 | $12,169,634 |
| Net operating income | $4,039,060 | $3,952,957 |
| Non-operating income | 160,028 | 156,246 |
| Gross income | $4,199,089 | $4,109,203 |
| Interest on funded debt | 2,093,415 | 2,137,051 |
| Remainder | $2,105,674 | $1,972,152 |
| Other Deductions from Gross Income: | | |
| Rents | $406,594 | $419,406 |
| Interest on unfunded debt | 70,745 | 96,087 |
| Interest on income bonds | 559,080 | 559,080 |
| Amortization of discount on funded debt | 50,376 | 58,088 |
| Miscellaneous | 42,613 | 40,222 |
| Total | $1,129,408 | $1,172,883 |
| Net income (transferred to profit and loss) | $976,266 | $799,269 |
| Car-miles | 35,873,841 | 34,964,036 |
| Revenue passengers | 238,658,380 | 233,732,146 |
| Transfer passengers | 92,838,315 | 90,808,955 |
| Revenue passenger per car-mile | 6.6527 | 6.6849 |
| Maint. cost per car-mile | .0557 | .0538 |
| Depreciation per car-mile | .0229 | .0231 |
| Ratio to Total Operating Income: | Per Cent | Per Cent |
| Maintenance and depreciation | 17.12 | 16.66 |
| Operating expenses and depreciation | 64.53 | 64.69 |
| Taxes | 10.93 | 10.79 |
| Operating expenses, depreciation and taxes | 75.46 | 75.48 |

*Decrease.

public require that the company should earn a surplus of $1,500,000 above all operating expenses (including depreciation), taxes, maintenance and interest on all of its bonds, including income bonds. The company's surplus as defined by the commission on the basis of a 7-cent fare was $976,266, or $524,000 less than the $1,500,000 specified by the commission.

The company is planning ahead financially. In 1922 it not only paid off all its own maturing obligations but called for redemption and paid off all of its 7½ per cent and 8 per cent obligations. In other words, during 1922 the company paid off $10,484,000 of underlying bonds, notes, car trusts and bank loans, and as an offset there was issued and sold a total of $8,500,000 securities, $6,000,000 of which were first consolidated mortgage bonds bearing 6 per cent and $2,500,000 five-year 6 per cent notes. At the same time holders of $2,684,000 of 4 per cent bonds exchanged their bonds for 6 per cent bonds paying the company $250 per $1,000 bond for the exchange. The result of the general plan of financing was that the company's maturing obligations were refunded, high interest bearing obligations were retired and the company's floating debt was paid. All of this was accomplished without any increase in fixed charges against income in 1922 and an actual decreasing charge thereafter.

With the accomplishment of this financing, the next step contemplated the bringing together of the three principal subsidiary companies, namely, the Maryland Electric Railways, the Baltimore, Sparrows Point & Chesapeake Railway and the Baltimore, Halethorpe & Elkridge Railway, into one company and have this consolidated company authorize a first and refunding mortgage. Accordingly, in January, 1924, the company, on behalf of the Maryland Electric Railways, sold $4,000,000 of the latter company's first and refunding mortgage gold bonds, Series A, 6½ per cent, due January 1, 1957.

The United Railways has no floating debt and, upon completion of the financing above mentioned, will retire the entire floating debt of the Sparrows Point and Halethorpe Companies and have on hand more than $1,000,000 for improvements, betterments and acquisition of new and additional property.

By agreement of Dec. 11, 1923, the wages of all employees were increased. It is estimated that this increase will cost the company approximately $175,000 per annum. The motormen and conductors, who form the largest class of employees, will receive the major portion of this amount.

In conclusion, President C. D. Emmons of the company says it may interest stockholders and the public to know what became of the 7-cent fare in 1923. He says that first of all, principally because of the fact that children ride for 4 cents, the average fare was not 7 cents but 6.80 cents, and the 9 per cent park tax on gross revenue within the city further reduces the average fare received by the company to 6.33 cents. He says that of this 6.80 cents:

| | | |
|---|---|---|
| Approximately $5\frac{1}{10}$ cents or... | 5 11/100 cents | was paid to employees for wages; to manufacturers for necessary supplies and material; to the tax collector, and for depreciation. |
| Approximately 1⅓ cents or.... | 1 30/100 cents | was paid for property rented and for money borrowed. (This represents the company's bonded debt held by approximately 115 savings and other banks in Maryland and approximately 5,036 individual investors.) |
| Approximately ⅓ cent or...... | 33/100 cent | was paid to 2,016 stockholders. |
| Approximately $\frac{1}{16}$ cent or..... | 6/100 cent | was credited to surplus. |
| | 6.80 cents | |

## Decrease in Traffic in Toledo in April

Slight industrial let-down in April brought about a decrease in car riding at Toledo and resulted in a deficit of $12,057 to the stabilizing fund, bringing the balance in the fund to $74,374 and pointing the way to fare increases or drastic curtailment of expenses.

Gross revenue of the Community Traction Company for April was $347,099. This is an increase of $19,115 as compared with the similar month last year. Increase of $18,826 in operating expenses due to higher wages and maintenance, increased fixed charges of $2,033 and additional interest and dividend expense of $3,270 offset this increase in revenue. A total credit of $70,000 was made to the maintenance fund. During April 4,984,013 revenue passengers were handled. This is an average of 166,134 a day, compared with a daily average of 179,028 a year ago.

Commissioner Cann in his report to the board of control declared that further decline in riding can be looked for in the summer months.

The commissioner urged speed in settling the power rate case as a means of obtaining relief for the company. He also favored the extension of the use of one-man cars to several other lines in the city.

## $187,341 Increase in Earnings in Portland, Ore.

The Portland Electric Company, Portland, Ore., the successor to the Portland Railway, Light & Power Company, reports for 1923 a balance of $735,162 compared with $547,821 for 1922. The company operates 298 miles of line. Its earnings statement follows:

STATEMENT OF EARNINGS OF THE PORTLAND ELECTRIC COMPANY

| | 1923 | 1922 |
|---|---|---|
| Gross earnings.......... | $10,825,380 | $10,120,898 |
| Operating expenses...... | 5,647,130 | 5,439,499 |
| Taxes.................. | 1,003,878 | 881,757 |
| Interest............... | 2,066,823 | 2,126,892 |
| Dividends— | | |
| Prior preferred........ | 205,001 | 32,543 |
| First preferred........ | 375,000 | 375,000 |
| Second preferred...... | 75,000 | .......... |
| Balance.............. | $1,452,548 | $1,265,207 |
| Depreciation........... | 717,386 | 717,386 |
| Balance.............. | $735,162 | $547,821 |

GENERAL STATISTICS FOR THE CALENDAR YEARS

| | 1923 | 1922 | 1921 |
|---|---|---|---|
| Number of revenue passengers carried........... | 67,995,333 | 68,661,868 | 69,840,734 |
| Number of transfer passengers carried........... | 22,565,980 | 22,762,174 | 22,686,798 |
| Number of non-revenue passengers carried..... | 2,575,181 | 2,476,672 | 2,535,218 |
| Total passengers carried... | 93,136,494 | 93,900,714 | 95,062,750 |
| Number of car-miles run....... | 16,034,821 | 15,972,536 | 16,175,365 |

## New Jersey's Tax on Gross Receipts Up $123,655

The State Board of Taxes and Assessment of New Jersey has announced that public utilities of the state, consisting of street railway, gas and elec-

| | Latest | Month Ago | Year Ago | Since War | |
|---|---|---|---|---|---|
| | | | | High | Low |
| **Street Railway Fares*** 1913 = 4.84 | May<br>1924<br>**6.95** | Apr.<br>1924<br>**6.94** | May<br>1923<br>**6.88** | May<br>1921<br>**7.24** | May<br>1923<br>**6.88** |
| **Street Railway Materials*** 1913 = 100 | Apr.<br>1924<br>**163** | Mar.<br>1924<br>**164** | Apr.<br>1923<br>**175** | Sept.<br>1920<br>**247** | Sept.<br>1921<br>**156** |
| **Street Railway Wages*** 1913 = 100 | May<br>1924<br>**219** | Apr.<br>1924<br>**219** | May<br>1923<br>**208** | Sept.<br>1920<br>**232** | Apr<br>1923<br>**207** |
| Steel—Unfilled Orders (Million Tons) 1913 = 5.91 | Apr. 30<br>1924<br>**4.21** | Mar. 31<br>1924<br>**4.78** | Apr. 30<br>1923<br>**7.29** | July 31<br>1920<br>**11.12** | Feb. 28<br>1922<br>**4.14** |
| **U.S. Bank Clearings Outside N. Y. City (Billions)** | Apr.<br>1924<br>**15.96** | Mar.<br>1924<br>**16.12** | Apr.<br>1923<br>**15.74** | Mar.<br>1920<br>**18.54** | Feb<br>1922<br>**10.65** |
| **Business Failures** | Apr.<br>1924 | Mar<br>1924 | Apr.<br>1923 | Jan.<br>1924 | Sept.<br>1923 |
| **Number** | **1,730** | **1,652** | **1,638** | **2,258** | **1,280** |
| **Liabilities** (millions) | **72.97** | **61.33** | **52.06** | **109 1** | **27.50** |

**Conspectus**
of
**Indexes**
for
**May, 1924**
Compiled for Publication in this Paper
by
**Albert S. Richey**
Electric Railway Engineer
Worcester, Mass.

| | Latest | Month Ago | Year Ago | Since War | |
|---|---|---|---|---|---|
| | | | | High | Low |
| **Eng. News-Record Construction costs** 1913 = 100 | May<br>1924<br>**222.4** | Apr.<br>1924<br>**221.6** | May<br>1923<br>**216.7** | June<br>1920<br>**273.8** | Mar.<br>1922<br>**162.0** |
| **U.S. Bur. Lab. Stat.** Wholesale Commodities 1913 = 100 | Apr.<br>1924<br>**148** | Mar.<br>1924<br>**150** | Apr.<br>1923<br>**159** | May<br>1920<br>**247** | Jan.<br>1922<br>**138** |
| **Bradstreet's** Wholesale Commodities 1913=9.21 | May 1<br>1924<br>**12.56** | Apr. 1<br>1924<br>**12 66** | May 1<br>1923<br>**13.67** | Feb. 1<br>1920<br>**20.87** | June 1<br>1921<br>**10.62** |
| Dun's Wholesale Commodities 1913 = 120.9 | May 1<br>1924<br>**184.7** | Apr. 1<br>1924<br>**186.8** | May 1<br>1923<br>**192.9** | May 1<br>1920<br>**263.3** | July 1<br>1921<br>**159.8** |
| **U.S. Bur. Lab. Stat.** Retail food 1913 = 100 | Apr.<br>1924<br>**141** | Mar.<br>1924<br>**144** | Apr.<br>1923<br>**143** | June<br>1920<br>**219** | Mar.<br>1922<br>**139** |
| **Nat. Ind. Conf. Bd.** Cost of living 1914 = 100 | Apr.<br>1924<br>**161.8** | Mar.<br>1924<br>**163.2** | Apr.<br>1923<br>**159.1** | July<br>1920<br>**204.5** | Aug.<br>1922<br>**154.5** |

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population.

Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen and conductors on 105 street and interurban railways in the United States, operating more than 100 passenger cars each, and weighted according to number of cars.

tric light, water, telephone and telegraph, district telegraph messenger, sewer and oil or pipe companies, will pay as a franchise tax for the current year a total of $5,433,983, an increase of $123,655 over the franchise tax for 1923. The tax is levied against a total of 227 corporations. The total gross receipts of all of the utilities amounted to $109,584,977. The receipts of the street railway companies were $20,604,659. The Public Service Corporation paid the largest tax. It was divided as follows: Public Service Railway, $891,747; Public Service Electric Company, $1,391,923; Public Service Gas Company, $1,192,276, a total of $3,475,947. The total receipts of the Public Service Railway were $17,834,957, a decrease of $3,964,761 from the total receipts of 1922. This decrease, of course, is brought about because of the strike of the employees last summer. The total tax of $891,747 to be paid by the Public Service Railway for 1924 is a decrease of $198,238 from 1923.

## $330,915 Net for Pacific Electric Railway

The Pacific Electric Railway, Los Angeles, Cal., operating 682 miles of line, reports net income of $330,915 for the year ended Dec. 31, 1923. The earnings of the company, reported in the fortieth annual statement of the Southern Pacific Company and proprietary companies, are shown in the accompanying statement.

INCOME ACCOUNT OF PACIFIC ELECTRIC RAILWAY, YEAR ENDED DEC. 31, 1923

| | |
|---|---|
| Operating revenues | $21,641,553 |
| Operating expenses (including depreciation) | 16,164,457 |
| Net revenue from operations | $5,477,096 |
| Taxes | 1,013,344 |
| Equipment and joint facility rents—net | ........ |
| Net operating income | $4,463,752 |
| Interest accounts with affiliated companies: | |
| Credit | ...... |
| Other income | 216,292 |
| Gross income | $4,680,044 |
| Interest on funded debt—bonds and notes | $2,754,928 |
| Interest accounts with affiliated companies: | |
| Debit | 1,239,341 |
| Other income charges | 354,860 |
| Total deductions | $4,349,129 |
| Net income | $330,915 |
| Income applied to sinking and other reserve funds | ...... |
| Income balance transferred to credit of profit and loss | $330,915 |

## New Jersey Board Reaffirms Its Position on Depreciation Charge

An order issued by the Board of Public Utility Commissioners of New Jersey takes issue with the contention of the Public Service Railway that earnings in 1923 did not justify setting aside more than $550,000 for depreciation and directs that no dividends be paid until the full amount of $1,100,000 be set aside as directed in a previous order, which the board holds to be not an "unreasonable stipulation."

The board directs the company to charge to an appropriate expense account $800,000 for depreciation, and further directs that up to and including July, 1926, the company shall pay periodically into the proper suspense account sums to aggregate $300,000, and concurrently to credit these amounts "to accrued depreciation of road equipment." That is, to depreciation before the board's order was first issued in 1921. The order says:

> If and when earnings justify, the amount so charged to suspense shall be amortized by debits to the account of "miscellaneous debits" until the amount so charged to suspense shall be entirely extinguished; and no dividends may be paid on the capital stock of the company until this shall have been done. The company is ordered to reform its books of account for Jan. 1 last to conform with the conclusions of the board.

## Tentative Plan Announced

### $500,000 Yearly Reduction in Fixed Charges Under Terms Suggested for St. Louis

Plans are taking definite shape covering some of the details of the terms of the proposed reorganization of the United Railways, St. Louis. It has been suggested that for each share of the existing common stock and $2.50 there be exchanged one-tenth of a share of a new issue of common stock of no par value. This would wipe out the old issue of common stock and create 24,913 shares of new common for which the company would receive $622,825 cash. For the 163,830 shares of preferred stock there would be exchanged new common on a share for share basis upon payment of $12.50 cash additional for each share thus exchanged. This would bring an additional $2,047,875 into the treasury. It is hoped to be able to pay $2.50 annual dividends on this new common stock, making it a 10 per cent stock.

The tentative refinancing plan calls for the issuance of $10,000,000 of 7 per cent preferred stock in exchange for the $9,790,000 of St. Louis Transit Company 5 per cent bonds. Transit bondholders are said to have agreed to accept this stock on the basis of the exchange of ten shares of stock for each $1,000 bond. This would leave $210,000 of this stock unissued in the treasury of the company.

Another $10,000,000 of preferred stock is also to be underwritten at 70, which would net $7,000,000.

The retirement of $2,000,000 of Suburban first mortgage bonds by payment in cash and the exchange of the Transit bonds for preferred stock would reduce the bonded indebtedness by $11,790,000 and leave the amount of bonds outstanding at $38,900,000.

It is also said that the plans call for the exchange of the $4,500,000 of Suburban general bonds for new first mortgage bonds of the Suburban to draw 5 per cent interest instead of 8 per cent as under the present extension agreement.

The fixed charges of the company under this plan would be $1,712,400. They would include $225,000 on the Suburban general bonds at 5 per cent, $1,212,000 on the United Railways general mortgage bonds and $275,480 on the underlying bonds. This is a decrease of $549,500 a year in fixed charges.

At present the company has a surplus of $4,275,573. With the new cash to be paid in the company would have $14,156,273 available to meet obligations. From this sum there would have to be paid $4,000,000 of receivership certificates, $2,000,000 of Suburban first mortgage bonds and $2,396,321 of back mill tax. This would leave a balance of $5,759,952 to provide for extensions, pay for improvements, meet reorganization costs, etc., and retire possibly $4,100,000 of underlying bonds.

## $2,500,000 Bond Sale Authorized by California Commission

Key System Transit Company has been authorized by the California Railroad Commission to execute a deed of trust to secure the payment of $10,000,000, par value, of its first mortgage bonds, and to issue and sell $2,500,000 of the bonds due July 1, 1938, $1,000,000 to be sold for cash at not less than par and accrued interest and $1,500,000 at not less than 94 per cent of face value and accrued interest. The proceeds obtained from the sale of these bonds are to be used by the Key System Transit Company to finance or pay these obligations:

| | |
|---|---|
| To finance part of purchase price of properties because of cash expended by trustees to acquire such properties at foreclosure sale | $283,561 |
| To pay unpaid interest on Twenty-third Avenue Electric Railway first mortgage bonds and Oakland, San Leandro & Haywards Electric Railway first mortgage bonds to July 1, 1923 | 106,377 |
| To pay notes to various banks covering moneys borrowed for bond interest | 69,550 |
| To pay notes payable to Realty Syndicate Company covering moneys borrowed for bond interest | 10,530 |
| To pay real estate mortgage against Stoer property No. 2, due March 17, 1923 | 22,500 |
| To pay San Francisco-Oakland Terminal Railways equipment notes | 50,000 |
| To pay interest on above notes | 1,000 |
| To pay ferry equipment trust certificates | 600,000 |
| To pay interest on such ferry equipment trust certificates | 3,850 |
| To pay car equipment trust certificates fifteen Key coaches | 175,000 |
| To pay interest on such car equipment trust certificates | 1,954 |
| To repay loans from depreciation fund | 439,250 |
| To pay part of cost of fifty-five new traction division cars | 646,426 |
| Total | $2,410,000 |

The accrued interest may be used for general corporate purposes.

The bonds thus authorized have already been marketed.

## Plan of Philadelphia Merger Revived

Banking interests in Philadelphia are studying the details in the plan proposed by Joseph Gilfillan, a member of the board of directors of the Union Traction Company, Philadelphia, for constructing an "enlarged P. R. T. Company" by consolidating the Electric Traction, People's Traction, Philadelphia Traction, Union Traction and Philadelphia Rapid Transit Companies.

The principal feature of the Gilfillan plan is the exchanging of securities of the new company for those of the companies merged, due consideration being given to priority. The issues of the new company would be of four kinds—first and refunding mortgage bonds, first preferred stock, second preferred stock and common stock.

The reorganization plan proposes the merging, not only of the five principal groups mentioned, but also of eight other railways, namely, the Catharine & Bainbridge Streets Passenger Railway, Darby & Yeadon Street Railway, Kessler Street Connecting Passenger Railway, Lehigh Avenue Passenger Railway, Market Street Elevated Passenger Railway, Philadelphia & Willow Grove Street Railway, Snyder Avenue Railway and Twenty-second Street & Allegheny Avenue Passenger Railway.

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**Authorizes Leasing of Shawnee Line.**—The Oklahoma Corporation Commission has granted permission for the Oklahoma City-Ada-Atoka Railway to lease for a period of ten years the property of the Oklahoma City-Shawnee Interurban Company. The property to be leased includes the old branch line operated by the Missouri, Kansas & Texas Railway from Oklahoma City to Atoka. The line runs from Oklahoma City to Shawnee, thence south to Coalgate and Atoka. It is planned to electrify the entire line, it is announced, and operate it for transportation of both freight and passengers. Details of the electrification plans have not been announced.

**Holding Company Chartered.**—The Southwest Power Company has been organized under the laws of Delaware with a capitalization of $3,100,000. The company's president is Albert Emanuel, head of the firm of Albert Emanuel, Inc., which recently purchased the Choctaw Power & Light Company and the Pittsburgh County Railway, McAlester, Okla., serving Pittsburgh and Latimer Counties with light, power and transportation. The new corporation also controls the Coal District Power Company, which furnishes light and power to coal fields of Logan and Scott Counties, Arkansas, and to a number of smaller towns. An offering of $2,100,000 of first mortgage 6½ per cent sinking fund gold bonds of the new company was made on May 22 at 97½ and accrued interest to yield 6.75 per cent.

**Seeks Approval of Abandonment.**—The Geneva, Seneca Falls & Auburn Railroad has asked the Public Service Commission to approve a declaration of abandonment of that part of its Pulteney Street line in Geneva, N. Y., between Jay and St. Clair Streets on the ground that operation of this part of its line is no longer a public necessity and convenience. The Geneva authorities have consented to the proposed abandonment.

**Net Corporate Loss of $7,598.**—The Glendale & Montrose Railway reports to the California Railroad Commission for the year 1923 that its operating revenue was $49,039 and operating expenses $53,845, giving a net operating loss of $4 806. The net corporate loss for the year was $7,598. The deficit at the beginning of the year amounted to $94,458. Miscellaneous additions to surplus for 1923 amounted to $21,366 and miscellaneous deductions were $426.

**Elevated Reorganization Securities Ready.**—The Chicago Elevated Railway reorganization committee has notified holders of certificates of deposits for secured gold notes and ten-year 6 per cent debentures that the plan dated July 14, 1923, for the reorganization of the Chicago Elevated Railways having been declared operative, the new securities deliverable by the reorganization committee to holders of certificates of deposit will be ready for delivery June 10. The distributable securities comprise first lien and refunding mortgage bonds and adjustment debenture bonds of the Chicago Rapid Transit Company and voting trust certificates for common stock. Until the close of business on June 5 the committee will continue to accept deposits of secured gold notes (extended or not extended) and of ten-year 6 per cent debentures of the Chicago Elevated Railways, subject to the terms of the plan and the reorganization agreement.

**Consolidation Approved.**—A merger of the Atlantic Coast Electric Railway and the Seashore Electric Railway, both in Asbury Park, N. J., into the Coast Cities Railway has been approved by the Board of Public Utility Commissioners. The application was made by the Eastern New Jersey Power Company. The consolidation is one of the steps intended to be carried out under the merger plan reviewed at length in the issue of the ELECTRIC RAILWAY JOURNAL for March 8, page 394.

**Accumulated Surplus for 1923 $319,904.**—The Tidewater Southern Railway, Stockton, reports to the California Railroad Commission for the year 1923 that its operating revenue was $236,049 and operating expenses $184,767, giving a net operating revenue of $51,282. The miscellaneous non-operating revenue amounted to $6,619. Interest, rent, taxes and other deductions totaled $52,853. The net corporate income for the year was $5,048. The deficit at the beginning of the year amounted to $286,053. Miscellaneous additions to surplus for 1923 amounted to $647,899 and miscellaneous deductions were $46,990. Accumulated surplus at the end of the year was $319,904.

**Court Orders Interest to Be Paid.**—At the request of the receiver of the New York Railways, Federal Judge Julius M. Mayer has ordered semi-annual interest on Broadway & Seventh Avenue Railway first consolidated mortgage bonds to be paid on June 1. The Broadway & Seventh Avenue Railway is one of the subsidiary companies of the New York Railways system and interest on the bonds has been regularly paid when due. Judge Mayer reserved decision on payment and interest on the Broadway Surface Railway first mortgage 5s due July 1, 1924.

**Unassenting Minority Holders Entitled to Full Payment.**—Judge Mullan in the New York State Supreme Court has ruled that minority stockholders of the Manhattan Elevated Railway are entitled to the full 7 per cent guaranteed dividend irrespective of the agreement by the majority to accept a smaller payment. Under the plan to which the majority of shareholders agreed the Interborough Rapid Transit Company, which operates the elevated lines under lease, paid 3 per cent last year, will pay 4 per cent this year and will pay 5 per cent next year. It is understood that the amount of stock held by unassenting or minority shareholders is about thirty thousand shares, or only 5 per cent of the total outstanding in the public's hands. The decision of Judge Mullan, it is said, does not affect the other 95 per cent of stock, as the holders of those shares agreed to accept smaller dividend payments than 7 per cent. The Interborough Rapid Transit Company is preparing to bring the case before the Appellate Division, and it is expected the matter will eventually get before the Court of Appeals.

**"Listening In" Causes Railway Slump.**—The deficit in the operating statement of the Cincinnati Traction Company, Cincinnati, Ohio, for April will necessitate an increase in the rate of fare from 9 to 9½ cents on July 1, W. Kesley Schoepf, president of the company, announced on May 17. A total of 353,582 fewer passengers were transported by the company in April than during the similar month of last year, and according to present figures the total for May will be 25 per cent less than for May, 1923. Receipts of the company have been decreasing for months, according to Mr. Schoepf in his monthly report to W. Jerome Kuertz, Director of Street Railroads. The higher fare, unseasonable weather, increase in unemployment, tendency of radio to keep people at home and the greater number of automobiles are among the causes assigned for the decrease in traffic.

**Abandonment and Extension Sought.**—The Birmingham Electric Company, Birmingham, Ala., has filed a petition with the Alabama Public Service Commission seeking a certificate of convenience and necessity of abandonment of operations over certain portions of the former Tidewater railway. The company also seeks permission to construct certain additional lines in the city of Birmingham. The petition states that these changes will make possible economies of operation through a consolidation of the Tidewater system with the lines formerly operated by the Birmingham Railway, Light & Power Company. This petition was set for a hearing June 25.

**Preferred Stock on Market.**—An issue of $101,000 of 8 per cent preferred stock of the Community Traction Company, Toledo, is now being placed on the market in Toledo to finance improvement of lines in West Toledo. Representatives of the security-selling division of Henry L. Doherty & Company, New York, are handling the sale of the stock at Toledo. The stock is required to be sold at par.

**Railway Bought.**—The Pennsylvania Power & Light Company recently purchased the Montoursville Passenger Railway and the Montoursville Electric Light Company, Montoursville, Pa. Both properties have been in continuous existence since their organization in the fall of 1897. No change in the names of the companies is contemplated. It is stated that the trolley line will be abandoned and a bus line substituted between Williamsport and Montoursville, the county court having recently authorized such action. The bus line, however, will be operated by a separate company.

# Personal Items

## J. W. Glendening Appointed West Penn Comptroller

J. W. Glendening was appointed comptroller of the West Penn Railways and subsidiary companies, Pittsburgh, Pa., and of the West Penn Power Company and its subsidiaries, effective May 1.

Mr. Glendening started on his railway career in 1899 in the office of the Camden-Suburban Railway, Camden, N. J. At the time that property was leased to the Public Service Corporation of New Jersey he was assistant to the secretary. For three years he served with the Public Service Corporation as assistant to the accountant in the railway department. His next move was to Saginaw, Mich., to fill the position of accounting assistant to the vice-president and general manager of the public utility companies controlling and operating the railway, electric and gas companies serving the cities of Saginaw and Bay City. During most of this time he was also treasurer of these companies. Later he was transferred to Jackson, Mich., as treasurer and assistant to the vice-president and general manager of the Michigan Railway. In 1919 he became secretary of this company and for the two years previous to his going to the West Penn companies served as secretary and treasurer.

His broad experience included also association with the Grand Rapids, Holland & Chicago Railways as secretary and treasurer and the Saginaw Bay City Railways as secretary.

## Farewell Banquet to Sam Greenland

Sam Greenland did not leave Fort Wayne without a "farewell' which took the form of a banquet at which business and professional men throughout the city grasped his hand and wished him "Good luck." A tangible expression of their feelings was a silver serving set which bore the inscription, "Presented to Sam W. Greenland in appreciation of his loyal service to Fort Wayne and its institutions. From his many friends, 1924." The speakers included Henry C. Paul, president of the Old National Bank. He said that the present efficient service in Fort Wayne was due largely to the management of Mr. Greenland. Robert M. Feustel, president of the Indiana Service Corporation, spoke of his business relations and associations with the "Big Swede," as he was familiarly termed by his close associates. Mr. Greenland recently resigned as general manager of the Indiana Service Corporation to go to St. Louis to assist in working out the details of the reorganization of the United Railways there.

**H. C. Kellerman**, after twenty-eight years of continuous service with the street railways of Kansas City, Mo., retired recently on a pension and removed to Los Angeles, Cal. He started his street car career in 1896 as a conductor on the Northeast Electric Company. Later he became cashier and auditor of that company. When the line was purchased by the Metropolitan, Mr. Kellerman became an assistant superintendent, but at his own request was transferred back to the platform of a street car. He then served as conductor for more than ten years. Later he went into the shops and took charge of the store room. More recently he has had charge of the stock at Ninth and Brighton. He is seventy-six years old.

## R. A. Moore Elected Illinois Association Head

R. A. Moore, general manager of the Aurora, Plainfield & Joliet Railroad, Joliet, Ill., was elected president of the Illinois Electric Railway Association at the recent meeting held in Chicago. Mr. Moore entered the railway field in Spokane, Wash., where he spent five years with the Ledgerwood Electric Railway. His record today includes thirty-five years of active service in both the electric and steam branches of the railroad business. Following his connection with the Ledgerwood property he entered the train service of the Northern Pacific, a steam line, where he remained for a period of ten years. It was in May, 1916, that Mr. Moore joined the forces of the Aurora, Plainfield & Joliet Railroad as general manager. Prior to that date he had served with the Peninsular Railroad in San Jose, Cal., in the capacity of electric locomotive engineer, train dispatcher, equipment inspector and later as first assistant superintendent. The last-named position he held for six and one-half years.

R. A. Moore

**Francis L. Searway**, formerly of the staff of Dwight P. Robinson, New York, and more recently appraisal engineer with Morgan & Morgan, Boston, Mass., has joined the appraisal division of Stone & Webster, Inc., Boston.

# Obituary

## Thomas Commerford Martin

Thomas Commerford Martin, long prominent in the electrical field as an editor and publicist, died from pneumonia in his home town of Pittsfield on May 17. He was sixty-seven years old.

For the past fourteen years Mr. Martin had been connected with the N. E. L. A., being from 1910 to 1919 its executive secretary and for the last five years secretary emeritus. At its session on May 20 at Atlantic City the N. E. L. A. passed a resolution of appreciation of the very valuable services which Mr. Martin rendered the industry.

Mr. Martin was born in London, England, but came to this country as a very young man. From 1877 to 1879 he was associated with Thomas A. Edison. In 1883 he became editor of *Electrical World*, and through his writings he exercised a great and beneficial influence on electric railway development. An ardent advocate of electricity as a motive power, he urged its employment in place of horses and cable through the columns of the *Electrical World*, through articles in popular magazines and the daily press, through addresses at technical and popular meetings and through his published books. Mr. Martin possessed a very attractive literary style and was as well a finished speaker, and his services in these early days were of inestimable value in establishing the pre-eminence of electrical power for railway service.

After the McGraw Publishing Company acquired the *Electrical World* in 1899 and until Mr. Martin severed his connection with the paper in 1909, he was also a frequent contributor to the ELECTRIC RAILWAY JOURNAL. Some of his contributions were in the form of editorials, others as signed articles. He resigned as joint editor of the *Electrical World* in 1909 to become executive secretary of the N. E. L. A. For many years he served as special expert of the United States Census office and not only collaborated in the preparation of the census reports of 1902, 1907 and 1912, but wrote extended portions of them.

Mr. Martin's published volumes are numerous. In some cases written in collaboration with another author, they are: "The Electric Motor and Its Applications" (1886), "Inventions, Researches and Writings of Nikola Tesla" (1893), "Edison—His Life and Inventions" (1910) and "The Story of Electricity" (1919). Mr. Martin was engaged on other volumes at the time of his death.

Mr. Martin was a past-president and charter member of the A. I. E. E., a past-president of the Engineers' Club and of the New York Electrical Society and a member of many engineering and other organizations. In 1907 he received the decoration of officer of Public Instruction from the French government. A lover of his fellow men and social by instinct and training, he actively promoted and held office in many movements for public benefit both in America and abroad, particularly during the war.

# Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

## How Waste Reduction in Industry Is Being Effected

Definite progress is being made in the nation-wide movement to reduce waste in industry through the elimination of excess varieties, E. W. McCullough, manager of the department of manufacture of the Chamber of Commerce of the United States, told the American Iron, Steel and Heavy Hardware Association at a recent meeting at Rye, N. Y. Work in this direction is being done by manufacturers of the following commodities:

*Reinforcing Bars* — The war time specification program reducing varieties from twenty-four to eleven has been somewhat disregarded since, and renewed action is being evidenced by several manufacturers to again establish a simplified schedule.

*Cold Rolled Steel*—Through the American Society of Mechanical Engineers, in co-operation with manufacturers, diameters of cold rolled steel shafting were reduced from sixty to fourteen.

*Forged Tools*—At the request of the Forged Tool Society, a conference of manufacturers, dealers and others interested was held on Feb. 11, 1924, to establish a reduced schedule for such items as picks, mattocks, mauls, sledges, crowbars, wedges, hoes and blacksmith tools, comprising tongs, hammers, chisels, swages, headers and drifts. This action has made possible a reduction in varieties from 549 to 365 and is to become effective July, 1924, subject to annual review and revision.

*Railroad Supplies*—In addition to the items included in the forged tool simplification affecting the railroad field, the Association of Manufacturers of Chilled Car Wheels has reduced varieties and sizes of chilled car wheels from 175 to four, thus achieving a 98 per cent elimination.

## New Railway Spring Plant

The W. G. Mitchell Spring Works of Johnstown, Pa., which has been engaged in the manufacture of helical springs for nearly twenty-five years, has been reorganized under the name of the Mitchell Spring & Manufacturing Company, Inc., and capitalized at $350,000. Fred A. Meckert, formerly general manager Fort Pitt Spring & Manufacturing Company, Pittsburgh, is president of the new company, which is now engaged in the construction of a modern plant in Johnstown.

In addition to its existing product of helical springs, the new company will begin production after Sept. 1 on a general line of railway springs, including elliptic as well as helical types. In planning its enlarged production program, the Mitchell Spring & Manufacturing Company will pay particular attention to railways. The Continental Railway Supply Company, with headquarters in the Peoples Gas Building, Chicago, will act as sales representatives throughout the central and western territory.

## $16,125,302 Net for Westinghouse

### Sales Billed in 1923 Exceeded Any Previous Year Except 1919—$63,738,702 of Unfilled Orders

The Westinghouse Electric & Manufacturing Company and proprietary companies report for the year ended March 31, 1924, net income of $16,125,302, after depreciation, inventory adjustments, interest, etc., equivalent to $8.98 a share on the combined 1,795,503 shares of preferred and common stock, as compared with net income of $12,263,485, or $8.19 a share, on the combined 1,496,253 shares of preferred and common stock in the year ended March 31, 1923.

Total current assets, including inventories of $80,000,000, were $153,209,401. after applying proceeds from sale of additional common stock, equal to more than six times total current liabilities. Net working capital was $127,478,988, as compared with $90,286,742 at close of the 1923 fiscal year. Inventories stood at $80,000,000, as compared with $68,971,104 as of March 31, 1923. Both issues share alike after $3.50 a share has been paid on each.

With exception of the year ended March 31, 1919, sales billed in the last fiscal year, totaling $154,412,918, exceeded those of any previous year in the history of the company. Notwithstanding a moderate recession in the volume of new orders booked during the last quarter of the fiscal year, the value of unfilled orders at the close of the fiscal year was $63,738,702, compared with $61,914,237 at the close of the previous fiscal year.

The charge in the profit and loss account for the adjustment of securities of European companies represents a reduction in book value of debentures of the former French and Italian Westinghouse companies to current rate of exchange as of March 31, 1924. Capital stocks of those companies were sold, as announced in previous reports, and the debentures owned by the company are the direct obligation of the present companies. Capital stocks of the Traction & Power Securities Company of London and its allied companies were sold during the year, so that the debentures now carried on the books at $396,535 are the only European investments owned by Westinghouse Electric. Interest thereon is being paid semiannually, also sinking fund payments annually.

Property and plant account shows an increase over the previous year due chiefly to extensions of the plant at Sharon and to completion of two new plants at Pittsburgh and one at Belleville, N. J.

## General Railway Signal Acquires Federal Company

The General Railway Signal Company, Rochester, N. Y., has completed arrangements to acquire the Federal Signal Company, Albany. The two companies manufacture railway signal devices and both have been in the business for nearly a quarter of a century installing block signals, automatic train stops and train control devices. Installations have been made in the United States, Japan, New Zealand and Australia.

Incident to the consolidation, there will be a new issue of bonds to consist of $2,000,000 General Railway Signal Company first mortgage twenty-year 6½ per cent convertible gold bonds, priced at 98½, yielding 6.65 per cent. The offering was by Merrill, Lynch & Company, New York; Schoellkopf, Hutton & Pomeroy, Inc., of Buffalo, Sage, Wolcott & Steele and Hibbard, Palmer & Kitchen, the latter two of Rochester. The bonds will be secured by a first closed mortgage on the real estate, plant and equipment of the company, appraised at $4,193,899.

## Long Island Lets Contract

The Long Island Railroad has awarded a contract involving about $700,000 to the Westinghouse Electric & Manufacturing Company for apparatus to furnish additional power required for the extension of electrification eastward to Babylon. It is understood that equipment for new substations will be included in the order, in addition to new apparatus to be installed in the present substations.

## $550,000 Value Placed on Barney & Smith Plant

An appraisement of $550,000 on the real estate of the Barney & Smith Car Company, Dayton, Ohio, has been filed in Common Pleas Court at Cincinnati, bringing total appraisement of the property, both personal and real, up to $960,511. Upon basis of this valuation the plant, originally appraised at more than $3,000,000, may be sold at public auction early in June for as low as $640,000, the law requiring that it bring at least two-thirds of the appraised value.

## Metal, Coal and Material Prices

| **Metals—New York** | May 20, 1924 |
|---|---|
| Copper, electrolytic, cents per lb. | 12.825 |
| Copper wire base, cents per lb. | 15.25 |
| Lead, cents per lb. | 7.125 |
| Zinc, cents per lb. | 6.10 |
| Tin, Straits, cents per lb. | 40.50 |
| **Bituminous Coal, f.o.b. Mines** | |
| Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons | $4.475 |
| Somerset mine run, Boston, net tons | 2.25 |
| Pittsburgh mine run, Pittsburgh, net tons. | 1.875 |
| Franklin, Ill., screenings, Chicago, net tons | 2.175 |
| Central, Ill., screenings, Chicago, net tons. | 1.90 |
| Kansas screenings, Kansas City, net tons.. | 2.50 |
| **Materials** | |
| Rubber-covered wire, N. Y., No. 14, per 1,000 ft. | $6.50 |
| Weatherproof wire base, N.Y., cents per lb. | 17.25 |
| Cement, Chicago net prices, without bags. | $2.20 |
| Linseed oil (5-bbl. lots) N. Y., per gal. | $0.97 |
| White lead, in oil (100-lb. keg), N. Y., cents per lb., carload lots. | 12.25 |
| Turpentine, (bbl. lots), N. Y., per gal. | $0.90 |

## Westinghouse Celebrates Birthday

The Westinghouse electric industries celebrated their fortieth birthday on May 20. This date was selected because on that day in 1884 George Westinghouse employed his first engineer to conduct electrical experiments for him. This was William Stanley, who invented the alternating-current transformer. Starting as a small plant located in Garrison Alley, Pittsburgh, Pa., in 1884, the Westinghouse company today has more than 50,000 employees and branch plants and offices are located in all parts of the world.

Some of the outstanding accomplishments of the Westinghouse company in its forty years of development follow: Adopted and perfected the alternating-current system of generation, transmission, transformation and application of electricity, brought out the first commercial induction motor, produced the first successful single-reduction street car motor, introduced into America the steam turbine and developed the high-speed turbine-generator for use with it, made the first commercially successful 60-cycle synchronous converter, and electrified the New York, New Haven & Hartford Railroad.

## *Rolling Stock*

**Indianapolis & Cincinnati Traction Company, Indianapolis, Ind.,** has ordered a complete equipment of Economy watthour meters with inspection dials. These will be installed on its new 600-volt passenger and freight cars.

**The Indianapolis Street Railway, Indianapolis, Ind.,** has ordered ten new city cars from the Cincinnati Car Company.

**Pacific Electric Railway, Los Angeles, Cal.,** now has ninety buses in operation, the majority of which have been built in its own shops.

**Department of Street Railways, Detroit, Mich.,** received two bids opened May 21 for furnishing ten 3-car articulated trains. The Cincinnati Car Company bid $25,420 and the St. Louis Car Company bid $26,995 each for trains complete according to department specifications f.o.b. Detroit Street Railway siding, Detroit. The contract had not yet been awarded on May 2, but the department recommends that the award be made to the Cincinnati Car Company.

## *Track and Line*

**Ohio Valley Electric Railway, Huntington, W. Va.,** is double-tracking its line between Twenty-ninth and Thirty-second Streets in Ashland. Construction work will be completed in about four weeks.

**Wisconsin-Minnesota Light & Power Company, Eau Claire, Wis.,** proposes to spend $177,031 for extension work, $1,140,870 for plant and line improvements and $259,558 for new operating equipment.

**Pacific Electric Railway, Los Angeles, Cal.,** recently awarded the contract for the construction of the new Pacific Electric tunnel to Twohy Brothers, Portland, Ore. The tunnel, built for the accommodation of the Hollywood, Glendale and San Fernando Valley lines, will cost about $3,500,000.

**Kansas City Railways, Kansas City, Mo.,** plans to carry out this year the heaviest track replacement program that has been undertaken in some years. The reconstruction of 3,880 ft. of double track on Tenth Street has been completed. This work was started on April 14 and was completed on May 4, at a cost of about $72,000. Cars were diverted while the work was in progress. The reconstruction of Troost Street tracks from Thirty-seventh Street to Forty-eighth Street involves the rebuilding of 13,516 ft. of single track at a cost of $124,000. On Grand Avenue from Fifteenth to Twentieth Streets 2,230 ft. of double track will be replaced at a cost of $61,000, and 9,960 ft. of single track in Independence, Mo., 10 miles away, are to be rebuilt at an estimated cost of $91,000. In addition to the replacements, two new extensions will be built, one from Seventy-second Street to Seventy-fifth Street, with a loop in front of the entrance of Fairyland Park. This will be a complete park terminal when completed, with direct admission gates leading from the cars to the park, prepayment area, and an inside loop for car storage. The estimated cost of these improvements is $61,000, of which the park company will pay $25,000 in ten annual installments. The second piece of new construction will be the loop at Muehlebach Park, the grounds of the Kansas City Blues. Here a double-track loop is contemplated, with storage capacity for more than twenty cars, which can be routed out immediately in both north and south directions. It is the company's effort here to furnish a service that will enable people to visit the ball games and get to and from the park much more easily than they do in automobiles. This improvement will cost about $33,000.

**Detroit United Railway, Detroit, Mich.,** through its directors, recently discussed financing to provide for extension of the system about 35 miles.

## *Power Houses, Shops and Buildings*

**Lehigh Traction Company, Hazleton, Pa.,** has started work on the erection of a new automatic substation at a point between Ebervale and West Oakdale.

**New York, N. Y.**—The Transit Commission has fixed June 2 as the date for the receipt of bids for the furnishing of the structural steel required for the framework of the new inspection shed at the 239th Street storage and inspection yard of the Interborough Rapid Transit Company. The shed will be for the inspection of subway cars. It will be 592 ft. long and 128 ft. wide. It will have eight inspection tracks with the requisite pits and will house eight trains of ten cars at once.

**New York, N. Y.**—The Transit Commission has opened bids for the furnishing and erecting of structural steel for the electrical repair shop in the Coney Island yard for the Brooklyn-Manhattan Transit System. The enterprise when complete will represent an expenditure of approximately $8,000,000.

## *Trade Notes*

**Continental Railway Supply Company, Chicago, Ill.,** has been organized, with headquarters in the Peoples Gas Building, Chicago, to handle the distribution of a general line of railway truck and car specialties. This will include continuous roller side bearings, Huntoon ball bearing center plates, elliptic and helical coil springs, double reversible sliding contact shoes and N. A. Petrie bus heating equipment. O. E. Quinton, formerly of the Burry Railway Supply Company, is president of the new company.

**Pittsburgh Testing Laboratory, Pittsburgh, Pa.,** announces the occupancy of its new laboratories and office building on Stevenson Street at Locust, Pittsburgh.

**Nic Le Grand, Inc., Rock Island, Ill.,** has recently booked among other business the following orders for the "Sutherland Positive Safety Features": Eighteen equipments for converted cars for the Knoxville Power & Light Company; seven equipments for the Illinois Power Company, Springfield, Ill., a repeat order; four equipments for the new cars for the Wisconsin Valley Electric Company, Wausau, Wis., and five equipments for the Dubuque Electric Company, Dubuque, Iowa, a repeat order.

**Fred J. Mershon,** for many years export sales manager of the Industrial Works, Bay City, Mich., has now taken entire charge of its Detroit branch office, located in the Book Building.

**J. D. Wallace & Company, Chicago, Ill.,** have moved into their new factory on South California Avenue. The new Wallace plant is a model of modern manufacturing practice.

**The National Ticket Company, Cleveland, Ohio,** has acquired full rights to manufacture and sell the combination cash fare receipt and hat check recently adopted by the Indianapolis & Cincinnati Traction Company. A description of this ticket is published elsewhere in this issue.

## *New Advertising Literature*

**Crouse-Hinds Company, Syracuse, N. Y.,** has issued folder No. 10 on electric hand lanterns.

**Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.,** has recently issued a sixteen-page publication entitled "Westinghouse Precision Instruments" and devoted to the construction, operation and performance of precision voltmeters, ammeters and wattmeters manufactured by that company. The booklet, which is known as folder No. 4603, gives complete information for the connection, reading and adjustment of Westinghouse precision instruments and for their application as standards for the calibration of other instruments and meters.

New York, May 31, 1924

# Electric Railway Journal

*Consolidation of Street Railway Journal and Electric Railway Review*
Published by McGraw-Hill Company, Inc.
HENRY W. BLAKE and HARRY L. BROWN, *Editors*

*Volume 63*
*Number 22*

## Traffic Relief Study Needs Railway Man's Counsel

SOME street railway men are taking the position that traffic relief measures inimical to the interest of the railway are less likely to be passed if they keep out of any active part in the considerations of this pressing question. It seems to the JOURNAL that this line of reasoning is very shallow and is indeed a desertion of the obligations to patrons and stockholders.

There are several reasons why railway men should take an active if not a leading part. From the standpoint of the number of people affected, the railway is four times as much concerned in traffic regulations as is any other interest. It is the railway man's responsibility to work for the best possible measures for the car riders, for the car riders are not organized in any way as are the automobile owners, the merchants, etc., each of which groups seeks to get that measure which most favors it. Furthermore, the railway man is better qualified by experience to suggest solutions and to point out the weaknesses of the many scatter-brain ideas that are put forth than almost any other person in the community. He knows the cost of putting the railway underground and of other extravagant proposals and the difficulty of financing such projects.

The facts the railway man can supply to show just how a bad measure would make ten thousand car riders suffer in delay and slow running in order to benefit two or three thousand autoists or fifteen or twenty merchants would seem to be convincing argument for giving preference to that other plan which would speed up the street cars and probably all other traffic too. Who else is there to bring out these facts if the railway man sits back and lets things take their course?

## Early Attitude Toward the Bus Now a Handicap

IT IS BECOMING increasingly evident how unfortunate it was that electric railway men by their early attitude permitted the public to get the impression that railway and bus are essentially antagonists. The majority of railway men have now come around to the point of view that the bus is a useful ally, though obviously there are many injustices in its present use that remain to be worked out. But the large majority at first took a decidedly antagonistic view of the bus, inspired largely by the irresponsible and cut-throat jitney competition which in many instances was the forerunner of the bus as it is known today, and the idea of this clash continues in the public mind. Had they at first welcomed the bus as a new tool that could be experimented with, looking toward the possibility of increasing the range of service to the public, the battle of the bus and the railway would never have existed in the public conception of the situation.

Our problem now is to live down this reputation as rapidly as possible and to show the public that bus and railway are natural allies, by and large, not enemies, and that we as transportation men are ready to use anything that will aid in providing the complete transportation service of the community. We ought not to be waiting for demands for bus service. We should be trying out the bus to see if it can be effectively used in some types of service. It would be better to show by demonstration that it is not wanted, or is not practical, than simply to try to tell the public without an actual demonstration that the bus cannot do any better work or supply any improvements to the service. Whether true or not, the people generally think the bus is an improvement over the street car, and there is only one good way to prevent them from giving permits to bus competitors in carrying out this impression. That is, for the railway itself to take the lead in the advent of the bus.

With the idea in mind of building the correct impression as of today in regard to the attitude of railway men toward the bus, it may be preferable to have the buses operated by and in the name of the railway rather than to form a bus subsidiary with the relation between the two somewhat obscure in the public mind.

## What Kind of Meat Does Cæsar Eat?

ANOTHER Charles A. Coffin prize has been won by a company of which Britton I. Budd is president. Last October the Chicago, North Shore & Milwaukee Railroad won the prize at the electric railway convention. Now, at the electric light convention last week, the Public Service Company of Northern Illinois was presented with the gold medal for distinguished accomplishment in the light and power field. Surely there must be something of outstanding genius in this executive's ability to conduct the affairs of large utilities. What is it? What is this man's formula? What peculiar gift has he that brings him these honors?

No one thing could be pointed out as more nearly answering these questions than that it is his keen sense of what constitutes good service and how to sell it. Good service in itself begets good public relations. And then to know how to sell it is to insure success to the company.

Another attribute which contributes to the success of Mr. Budd's companies is his progressiveness. There is never a time in his official family that there is not some new development on foot, looking toward improvement of service, or enhancement of the company's ability to serve. Just now, for example, the Chicago Rapid Transit Company organization is attracting widespread interest in railway and financial circles by its campaign to sell $5,000,000 of 7.8 per cent prior preferred stock to employees and patrons. While the financial record of the elevated lines has not been attractive, this campaign will probably go "over the top." In the background of this effort, however, has been his program, long and difficult, of working out a new financial structure for the elevated lines, including a consolidation of them and a reduction in capitalization of the new company to an amount within the accepted present valuation.

Then again, while Mr. Budd is frequently referred to in the industry journals because of some new original idea that has been put into effect, proved practices developed anywhere for doing the job in any department better or with less expenditure are utilized and actively pushed in the Budd organizations. This, of course, reflects another principal reason for his success—his gift of surrounding himself with able assistants, who have the confidence in him and the ability to see all these things through. And it isn't all easy sailing, by any means. But the will and courage to keep progressing are building results that tell.

### The Large City Is a Product of Transportation

THERE will be a population of 8½ millions of people in New York City in 1940, and 12½ millions in 1960, according to recent estimates of the engineers of the New York Telephone Company. It is staggering to think of these increases from the six millions living in the city in 1924. But the estimates of these engineers are noteworthy for their accuracy, and there seems no reason to doubt them.

In the case of New York, as of any other American city, the only thing that permits the congregation of such vast hordes within the confines of a small area is mass transportation of the most intensive type. Subway, elevated, surface car, bus, steam railroad—all are needed to bring the people together to the places where they work and where they live. Manifestly it is impossible, in the American type of city, to house so many people within walking distance of their work, and rapid transit lines must be prepared to carry them considerable distances.

To keep up the growth of the city a corresponding expansion of rapid transit facilities is essential. In many cities the transit facilities are now used to capacity, and further city growth is being stunted on account of this.

Transit can be provided only if it can be made self-sustaining, or else subsidized. With fares held to a point where the companies can barely make both ends meet, no new capital is forthcoming, and facilities cannot be extended. Obstructionist tactics on the part of misguided city governments that put politics and convenient issues above true effort toward relief for the public may help the officeholders temporarily, but in the long run they will only harm the cities they say they are so anxious to serve. Civic bodies and public-spirited men generally should get together and work to provide the transit facilities that are so essential to the growth and prosperity of the cities, and above all to see that the companies which struggle with these great transportation tasks are given a fair chance to work out their problems, for the benefit of the whole community as well as the railway.

### After the Safety Parade—What?

A SPIRIT of carefulness, a sense of responsibility and a feeling for others are indissoluble and invaluable qualities, usually innate, but ofttimes acquired. The outside influences which have some bearing on the acquisition of the virtue of prudence are as great in number and diverse in character as are the patients in need of this cure. With these considerations in mind it is to be hoped that some of the irresponsibles were on Fifth Avenue, New York, Saturday, May 17, when a "Safety First" drama was enacted, under Barron Collier as grand marshal, unfolding the story of "taking a chance," "stepping on the gas" and "it's up to the other fellow," with the sickening results before the spectators' very eyes of wrecked property, maimed bodies and crushed spirits.

Such revolting pictures have been depicted for many years by safety organizations in various communities in an effort to bring home to those not naturally endowed with the doctrine of "Watch Your Step" that the high cost of heedlessness and carelessness is sometimes misery for those sinned against and often ruin for the sinners. Such influences as slogans, safety meetings and parades have without question brought more than satisfying results—a fact which is especially evidenced by the accident records of many railways.

However, the loss of life due to accidents continues so appalling that there must still remain in the ranks of the reckless many who view a parade in a detached way, hear the band with insensitive ears and find only humor in the harrowing scenes depicted on the floats. Although this type of offender, who willingly and unwittingly "carries on" in his rash way, is always a cause of solicitude, yet when he consistently and persistently follows a speed program he eventually eliminates himself from consideration. Rather are we concerned with the emotional lawbreaker who at least makes a resolve, weak though it be, to mend his careless practices. Here the outside influence in the form of a parade or a slogan finds a fitting subject to whom to impart the lesson of vigilance and discretion. If that subject, at the next psychological occasion, remembers the lesson of the safety spectacle, then all the time, energy and money expended are well rewarded.

### The Old Idea About Salaries Is Passé

THERE used to prevail a fairly definite reason for the great disparity between the salary of the general manager of the electric railway and that of his principal assistants. The thought was general among holding company executives and boards of directors that if there were high salaried assistants, then there was not justification for as high a salary for the company head. So the manager held his subordinates down.

Whether for the same reason or not, this policy continues to be in evidence, though low pay is quite out of harmony with present-day thinking that the utility executive's best prospect of success is to surround himself with the ablest assistants available. The utility business these days is so difficult and involved that it calls for specialists of high calibre, and to retain such men requires better compensation than commonly prevails. What the industry is most in need of nowadays is more outstanding ability and less mediocrity.

# Kaw Valley Line Is Working Out Extensive Freight Facilities

### Through the Purchase and Development of the Kansas City Terminal Property of the Orient Railway, the Kansas City, Kaw Valley & Western Railroad Is in a Strategic Position to Handle Freight Through the Kansas City District

**Over 600,000 Cu.Yd. of Material Had Been Removed at the Summit of the Divide Between the Missouri and Kaw Valleys at the Time the New Right-of-Way Was Purchased**

The cut is 65 ft. deep and extends for a maximum width of 400 ft. because of slides. The snow line at the left and the house at the right mark the limits of the excavation.

SINCE the purchase, in 1922, of the Kansas City terminal properties of the bankrupt Orient Railway by the Kansas City, Kaw Valley & Western Railroad, the latter has been making extensive developments on the new property which will ultimately put it into a strategic position in the Kansas City freight terminal district. A subsidiary organization, known as the Kansas & Missouri Railway and Terminal Company, has been organized to take over and develop the old right-of-way of the Kansas City, Mexico & Orient Railroad, connecting the valleys of the Missouri and Kaw Rivers through Kansas City, Kan. Approximately 250 acres of industrial sites is available along this route.

## NEW LINE BADLY NEEDED

An appreciation of the value of the new right-of-way and connecting property is best given by a brief study of the freight terminal situation in the Kansas City district. Practically all the steam railroads entering the two Kansas Citys must interchange freight equipment through the Kansas City terminal. The large volume of freight movement resulting is limited to two heavily congested routes. The first of these is through the Union Station terminal trackage, and the second is through a very narrow right-of-way on the north of Kansas City which is known as the "Gooseneck." As a result of the limited facilities available the terminal trackage is subjected to extreme congestion and it frequently takes from two to five days to get carload shipments through this area.

The plan originally projected by the Orient Railway was to give a water level right-of-way from the Missouri Valley to the Kaw Valley for the purpose of providing an additional route through the Kansas City district. Approximately $1,800,000 was spent by the original owners in the physical improvement of the right-of-way, and the grades across the divide between the two river valleys through Kansas City, Kan., were reduced to a point where very little additional heavy construction work has been required.

## GRADING WAS ALMOST COMPLETED

The greater part of the $1,800,000 spent by the Orient Railway was consumed in putting through a single cut at the peak of the divide in which over 600,000 cu.yd. of material were removed. At the time the property was purchased by the Kaw Valley line bridges had been installed in the cut-off between the two rivers and the work of grading was approximately 80 per cent finished. Although the original plan to provide a water-level route with one-half of 1 per cent maximum grade has been temporarily abandoned, the grading as now completed includes only a 1½ per cent maximum grade for approximately 1,000 ft. in order to get over the hump in the center of the cut-off. The 2-mile extension at the southern end, which has been in operation for some time, connects the Kaw Valley line with the Rock Island, Kansas City Southern and the Kansas City terminal track.

Since the purchase of this terminal property, the new owners have completed the work of grading and have laid a single-track line with 85-lb. rail over the entire route. In addition, industrial siding trackage has been laid to serve a large portion of the industrial property along the right-of-way. This has made it possible actively to push the work of locatig new industries on the property.

Several large steam road terminal projects adjoin and connect with the Kaw Valley property. On the accompanying map is shown the new 1,600-acre terminal development of the Union Pacific Railway, located at 3. Application has been made for a franchise to enable the Kaw Valley line to reach this district. The new right-of-way also extends to 40 acres of land lying adjacent to the Burlington yards in the North Kansas City district, shown at 4 on the accompanying map, and the right is included to build a bridge across the Missouri River to connect to this property when the investment becomes justified.

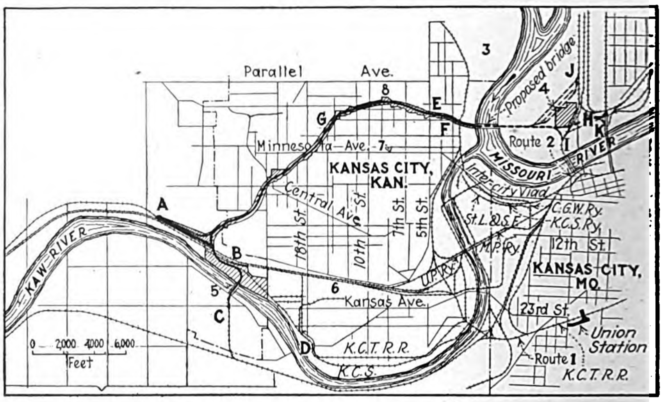
### IMPORTANT INDUSTRIAL CONNECTIONS

Contemplated plans call for the construction of a bridge at 5, across the Kaw River, to open up a connection with a 180-acre industrial tract now owned. The extension would connect with the Turner Bottoms district, which is a 1,300-acre tract in process of industrial development. This would reach the Santa Fé yards, which are the largest in the Kansas City district, and would also reach a number of important industries located in this district. Among these are the Armour elevators, with a capacity of more than 5,000,000 bushels of grain; the Sinclair Refining Company and the United Zinc & Chemical Company. The refining plant is expected to become the terminus of a new pipe line from the Wyoming oil fields, which will increase the importance of this location as an oil-distributing center.

An industrial district of considerable size, indicated at 6 on the map, is now served by the Kaw Valley line. The industries in this district develop approximately 100 cars of outgoing freight per day. In addition, many cars of raw material are delivered to these industries daily. From 24 hours to 5 days will be saved in moving freight through the Kansas City district by the new service offered.

### ELECTRIC OPERATION ADVANTAGEOUS

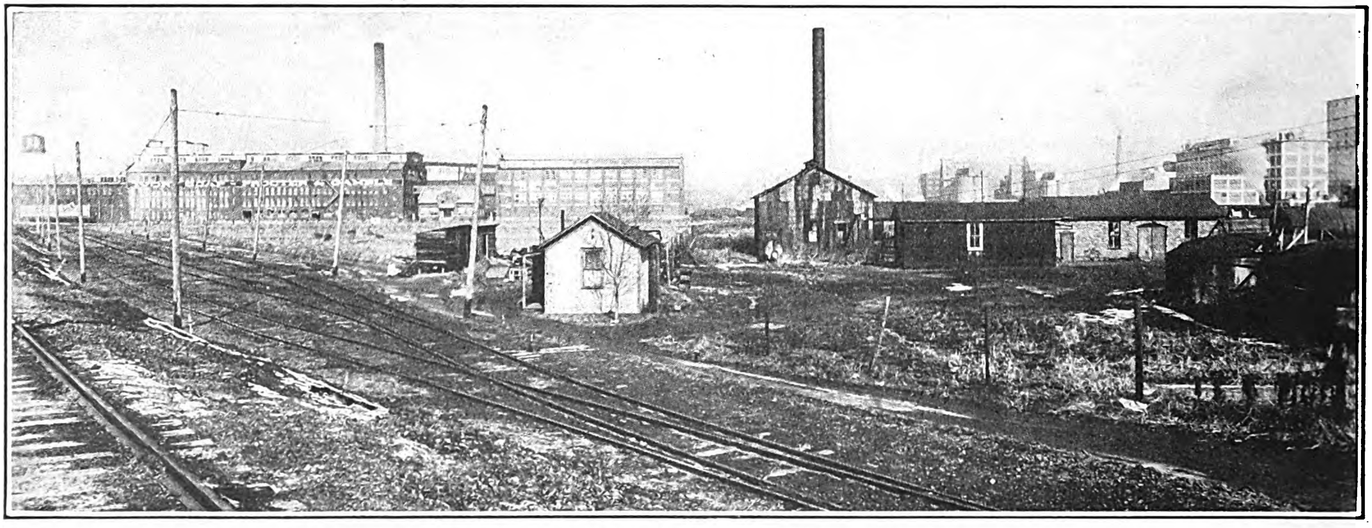
Electric operation of this new terminal line is particularly advantageous because of a number of conditions. In the first place, a residential section has been built up in Kansas City, Kan., to a point where it closely adjoins the right-of-way. This includes some of the best residential property in Kansas City, Kan. Electric operation makes possible the completion of the project and the development of freight business on a large scale with very much less opposition from surrounding property owners than would be the case with steam operation. Electric locomotives are able to work around short radius curves and make it a much simpler physical problem to obtain entry into some of the adjoining industrial sites. In addition, a considerable saving is made in switching cost, as this averages roughly between $16 and $22 per hour for a switch engine and crew in the Kansas City district.



**The New Kaw Valley Freight Terminal Line Connects the Missouri and Kaw Valleys Through Kansas City, Kan.**

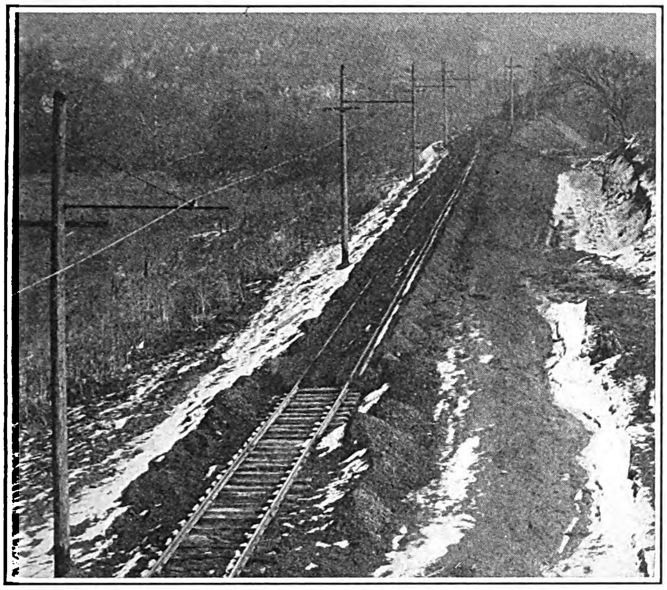
Map shows strategic location relative to steam roads and industrial districts. Shaded areas represent industrial property owned by the line. A—Kansas City, Kaw Valley & Western Railway. B—Chicago, Rock Island & Pacific Railway, Union Pacific Railway. C—Atchison, Topeka & Santa Fé Railway. D—Kansas City Southern Railway, Kansas City Terminal Railway. E—Kansas City Northwestern Railway. F—Missouri Pacific Railway, Chicago Great Western Railway. G—Kansas City, Leavenworth & Western Railway. H—Kansas City, Clay County & St. Joseph Railroad, Chicago, Burlington & Quincy Railway, Chicago, Rock Island & Pacific Railway, Wabash Railroad, Union Depot Bridge & Terminal Railroad, Quincy, Omaha & Kansas City Railroad, Chicago, Milwaukee & St. Paul Railroad. I—Hannibal Bridge. J—Chicago, Burlington & Quincy Railroad. K—Armour-Swift-Burlington Railway Bridge.

There is an excellent prospect for the development of through freight business to and from the business district of Kansas City, Kan., which has a population of approximately 125,000. Minnesota Avenue is the main business street of this district and it is estimated that approximately 75,000 people trade on this street. Merchandise is now trucked from congested freight terminals in Kansas City, Mo. By the construction of a new freight terminal, which it is planned to locate at 8 on the map, it will be possible to bring in freight over any of the lines coming into Kansas City and to



**A View of Some of the Large Industries Tributary to the Kaw Valley Line**

A large Armour elevator is shown in the distance and the Procter & Gamble plant at the left. The triangular section in front of the soap plant is one of many attractive industrial sites owned by the Kaw Valley line.



Heavily Ballasted Track and Flexible Overhead Suspension Are Designed Primarily to Handle Heavy Freight

consign it directly to the new terminal without passing through the congested freight section. Freight originating on the Chicago & Alton, Burlington, Wabash, Chicago Great Western, Chicago, Milwaukee & St. Paul, Rock Island, Missouri Pacific and Santa Fé from the north and east can be handled over the new line. From the south and west direct shipments can be routed over the Kansas City Southern, Frisco, M, K. & T., Santa Fé, Rock Island and Union Pacific.

### NEW INDUSTRIES BEING LOCATED ON LINE

There are 8 miles of line in the newly acquired right-of-way and 4 miles of siding now under construction. An industrial agent with a corps of assistants is actively engaged in locating industries along the right-of-way. The practice in leasing land for industrial sites under the Interstate Commerce Commission rulings has been to use the minimum rate of 6 per cent of the fair valuation of the land as an annual charge. In most cases these leases are being made to material yards and other industries requiring small investment in permanent buildings but moving heavy carload freight. Most of the leases are made on a one-year term, but in some cases longer terms are being written with factories and other permanently located industries. The primary idea has been to encourage the location of new industries as rapidly as possible, making the rental rate low in order to accomplish this result and limiting the profits of the property to those obtained from handling the freight business to and from the new industries.

The strategic position in which the Kaw Valley line now finds itself has materially improved its relations with surrounding steam lines. When this road first went into the freight business, six or eight years ago, considerable trouble was encountered in obtaining recognition for interline agreements from the steam roads. Now, however, such agreements are effected with no difficulty, as the Kaw Valley line is in an exceedingly favorable position to facilitate the movement of freight between all of the incoming steam lines in the Kansas City district.

## Interest Charges Slightly Lower than in 1922

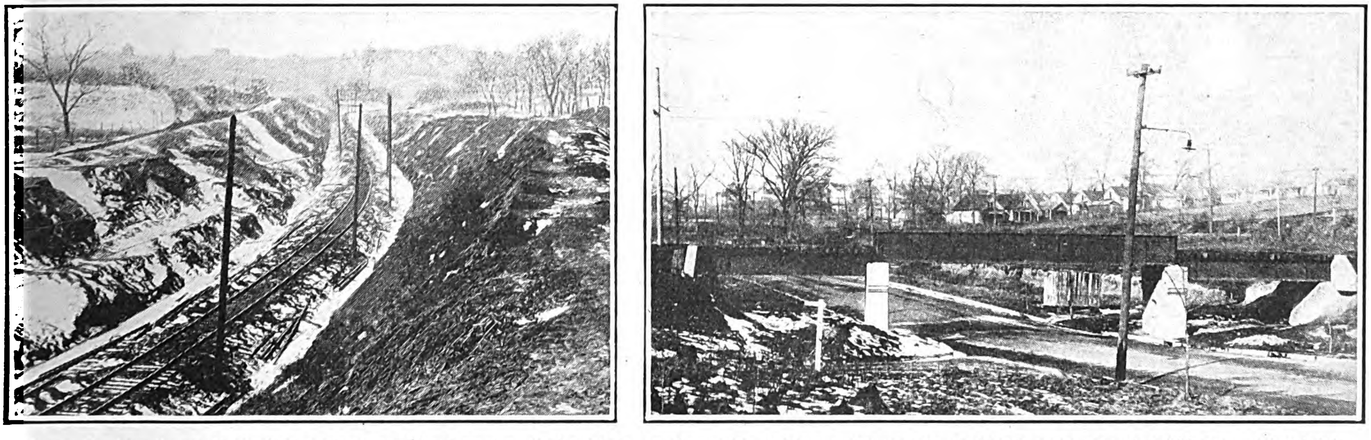
AN ANALYSIS of the interest rates required for public utility financing during 1923 has been made by H. B. Dorau of the Institute for Research in Land Economics and Public Utilities, Madison, Wis. The results are published in "Institute News." The analysis, based on $866,964,300 par value of securities, shows a weighted average rate, based on offering price, to be 6.06 per cent, compared with the figure on a similar basis of 6.16 per cent in 1922. The total public utilities securities issued in 1923 were in excess of $1,000,000,000. It was possible to obtain the necessary facts as to offering price, amount at maturity, however, for only the par value given above, after the common and preferred stocks were excluded.

In addition to the four classes of securities mentioned in the table the statistics included equipment certificates issued by the electric railways only. The weighted average rate for these certificates was 5.62 per cent. This low figure had a considerable influence on reducing the weighted average in the table for all the securities issued by electric railways.

WEIGHTED AVERAGE RATE (IN PER CENT) OF UTILITY SECURITIES ISSUED DURING 1923*

| | All Securities | Bonds | Notes | Debentures |
|---|---|---|---|---|
| All utilities | 6.06 | 6.05 | 6.59 | 5.95 |
| Light and power† | 6.18 | 6.15 | 6.54 | 6.57 |
| Gas and electric | 6.20 | 6.20 | .... | .... |
| Railway and electric | 6.34 | 6.25 | 6.62 | 6.73 |
| Gas utilities† | 6.41 | 6.36 | 7.57 | .... |
| Telephone and telegraph | 5.43 | 5.21 | .... | 5.62 |
| Electric railways† | 6.21 | 6.52 | 6.42 | 6.90 |
| Water utilities | 5.40 | 5.40 | .... | .... |

* Yield based on offering price to maturity.
† Exclusively.



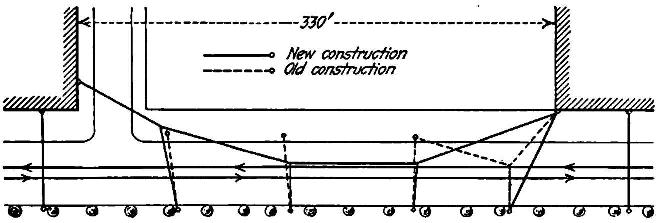
At Left, the Summit Cut Is About a Mile Long and the Line as Completed Has a 1½ per Cent Grade for About 1,000 Ft. At Right, Bridges Over Streets Avoid Grade Crossings. This View Shows Type of Construction Over Washington Boulevard

# Supporting Trolley Wire Without Poles

### Special Studies of Municipal Lines of Munich, Germany, Have Shown that Attachments to Buildings Can Be Used to Replace Poles in Many Cases

THE overhead construction at a number of intersections and special layouts is being supported directly from the abutting buildings on the trolley lines of the Munich, Germany, municipal street railways. This has been made possible by a careful study that has resulted in considerable simplification in the layouts, and has contributed materially to freedom from wire troubles, according to an article in *Verkehrstechnik.*

Just prior to the world war, the free span of the trolley wires was 25 to 27 m., and the cross-section of the grooved contact was 80 sq.mm. on approximately 185 km. single-track length.



**Special Overhead Construction Permitted Removal of Poles on Orleans Street in Munich**

The war forced the replacement of practically all the installed copper wires by iron wires, and necessitated that the management reduce as far as possible the use of further bolts, hooks, wires of any kind, insulators, etc. Considerable simplification was found possible with a more efficient use of the most expensive element, the steel tubular poles, of which at least 20 per cent could be eliminated.

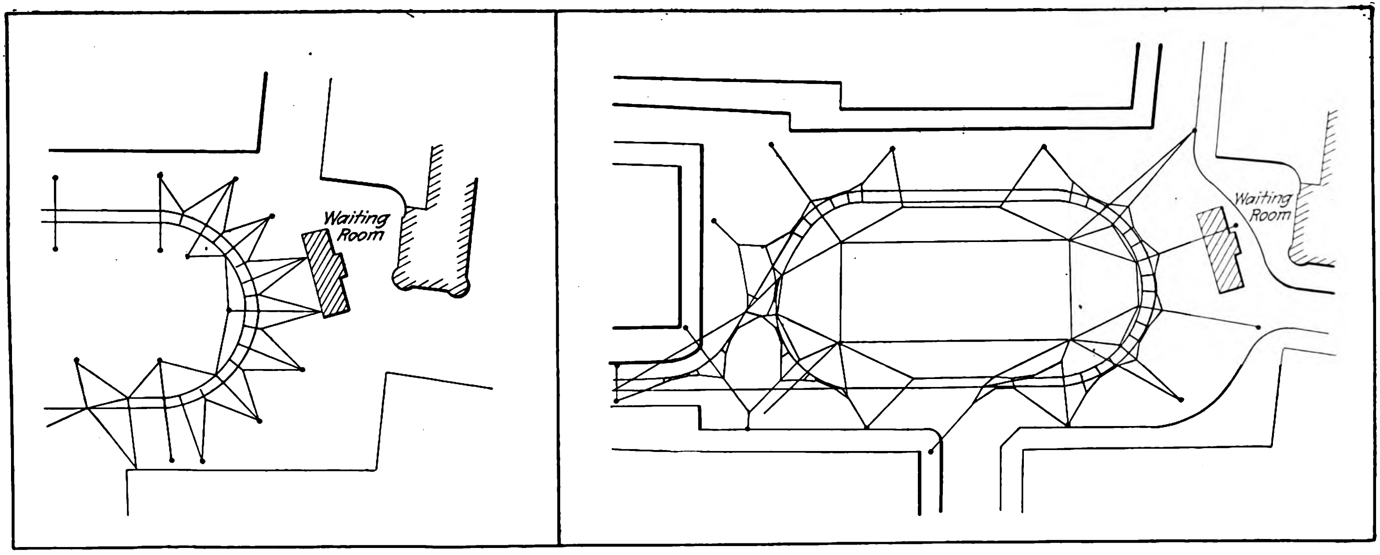
A number of conditions had to be met to obtain this result. First of all the landlords had to be persuaded to permit fastening the trolley wire construction to their houses. As this was for a time impossible of attainment, only partial success was obtained in this respect.

Longer free spans had to be used. At first there was some hesitation on the use of long spans for the suspension wires, but soon it was found that such long suspension wires gave the overhead an elasticity which diminished considerably the hammer blows at the ears. Today free spans of up to 100 meters are nothing unusual. The higher the wires are fastened the less the disturbance. A location of the attachment rosettes on houses as high up as 20 m. and more is not unusual, with a standard trolley wire height of only 6½ m. above the rail. In streets not built up, or where the houses were too low, the gaps had to be bridged. This was done without great difficulties.

## COMPLICATED LAYOUTS WERE DIFFICULT OF SOLUTION

The two points that caused the greatest trouble were complicated layouts in large open squares with loops or special trackwork, and in rebuilding older parts of the system that had been constructed with little heed to modern practice. It was found that the construction of the overhead work involved a theoretical problem of design which, as experience showed, could be solved in all gradations between good and bad. These preliminary calculations required great patience, and detailed investigations of the stresses could not be avoided. A good solution could, however, always be found. On loops and in large squares the poles on the inside could be avoided best by bringing all the guy wires to one point or at the corners of a triangle, a rectangle, or other polygon, and from these points suitable span wires were carried to interlock the construction.

In such complicated cases the solution of the problem was found only by a cut-and-try calculation. It was always desirable to use the smallest possible number of guy wires because of the saving of material. In general, steel wires of 5, 6, 7 and 8 mm. diameter were used, corresponding to pulls of 400, 600, 800 and 1,000 kg. Care had to be taken, of course, to investigate the quality of the wall to which the suspension rosette was to be attached. It had to be decided whether a large or a small rosette was to be used, or whether a wall hook or a stone screw would be better. The steel wires had to be tested, and it was found desirable to take from each reel of wire a test piece before using it. Frequently large differences were found in the same kind of wire.



**The Overhead Wire Layout at the Grünwald. At Left, Part of Old Construction Supported Entirely on Poles. At Right, New Construction with All Poles Removed from Center and Minimum Number of Poles on Outside**

Similar experience was had with insulators. The best insulator is the stirrup type, which is made in different sizes corresponding to pulls of 250, 500, 750 and 1,000 kg. All insulators whose metal is not completely surrounded by insulating material were discarded, because such insulators start rusting where there is an open space between metal and insulator, and this rusting will break the insulator. Very good results have been had with an egg-shaped porcelain insulator. It can be used very nicely on all standard carrying wires, and has a permanent insulation with a safety factor of about 5. The porcelain egg withstands a pull of 900 to 1,000 kg.

It was also found possible to make great savings in the number of insulators. Previously a great number of insulators had been used in curves, because the strain wires were carried individually to the anchor poles, causing a great waste of insulators. Better results have been had with three insulators in series between trolley and ground (pole or building). The first insulator is that built into the trolley wire hanger. A second insulator is placed about 75 cm. away from the wire, and the third one is placed immediately before the wall rosette or the pole. Then it is impossible that in case of a break of a suspension wire, any part of the span wire could possibly be under electric tension.

### HOW THE POLES ARE ELIMINATED

The change of the overhead line construction in Orleans Street is shown in an accompanying diagram. The old overhead construction is shown in dotted lines, and the new construction in full lines. It can be seen from these how it was possible to improve the aspect of the street. The contact wires are installed at the same height, and the safety has not been impaired. A slightly larger amount of steel wire permitted the elimination of three poles.

The loop in the Grünwald square before and after the change is shown in two other diagrams. With the old arrangement 38 poles were required, while with the new plan 15 poles serve the same purpose. Thus it was possible to save in this one single case 23 structural steel poles and to omit all poles from the inside of the loop. Although in making this change the trolley wire was laid out to conform much more closely to the track curves, a smaller number of insulators was used. All wires are taut and give the whole arrangement a very neat appearance. Within the loop the suspension wires are brought together to four points which are connected together to equalize the pull. The four points themselves are carried by heavy steel wires to the outside of the loop and are fastened to structural steel poles in symmetrical arrangement and proper height.

The work requires intelligent men, great precision and good training. The height of the wall rosettes has to be determined exactly to correspond with required height of the wires, the weight of the supporting construction and the resulting mechanical pull. These points are essentially to obtain a uniform height of the trolley wire.

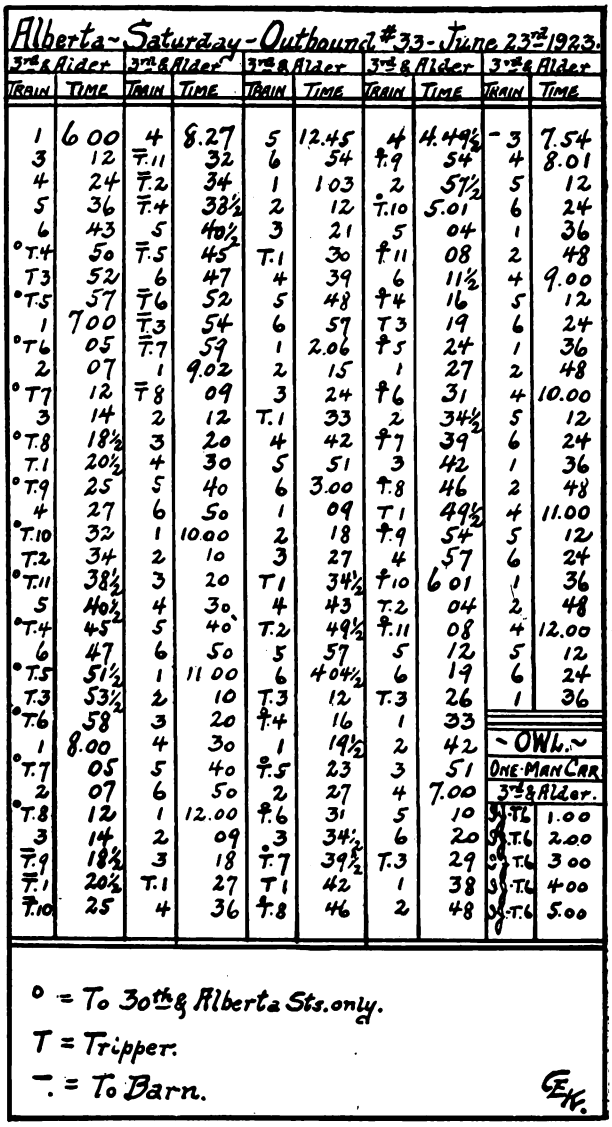
### COST OF LINE WORK REDUCED

Changes in the method of suspension, such as those described, have shown that it is not difficult to simplify and to cheapen overhead line work for street railways as much as 50 per cent. The number of poles may be greatly reduced and savings may be realized on attachments and insulators. These simplifications of the overhead will further mean considerable reduction of operating expenses, especially if care is taken to locate the trolley wire properly with respect to the rails. And last but not least, the esthetic aspect of the city will be greatly enhanced.

## Schedules for Patrons

FOR the use of its inspectors, the Portland Railway, Light & Power Company, Portland, Ore., issues, in blueprint form, small schedules of individual lines. These are provided with a margin so that they can be held in a memorandum book, if desired. They show in tabular form the numbers of the different trains and the times they should arrive at the terminals, or other points in the case of turn-back cars.

While these small time-tables are not intended for public use, the company has found them useful, at times, to give a person asking for definite information about the schedules of a particular car line or of several car lines. In this case the company does not hesitate to give out an inspector's time-table. One of these time-tables, actual size, is reproduced.

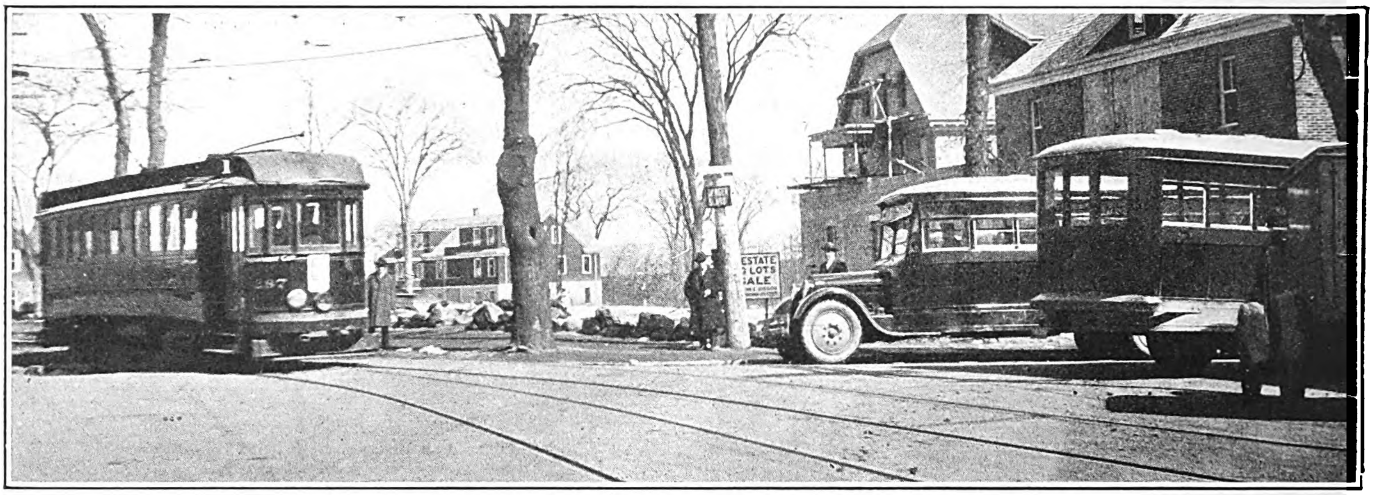


Alberta ~ Saturday - Outbound #33 - June 23rd 1923.

| 3rd & Alder | | 3rd & Alder | | 3rd & Alder | | 3rd & Alder | | 3rd & Alder | |
|---|---|---|---|---|---|---|---|---|---|
| Train | Time | Train | Time | Train | Time | Train | Time | Train | Time |
| 1 | 6 00 | 4 | 8.27 | 5 | 12.45 | 4 | 4.49½ | -3 | 7.54 |
| 3 | 12 | T̄.11 | 32 | 6 | 54 | °T.9 | 54 | 4 | 8.01 |
| 4 | 24 | T̄.2 | 34 | 1 | 1 03 | 2 | 57½ | 5 | 12 |
| 5 | 36 | T̄.4 | 38½ | 2 | 12 | °T.10 | 5.01 | 6 | 24 |
| 6 | 43 | 5 | 40½ | 3 | 21 | 5 | 04 | 1 | 36 |
| °T.4 | 50 | T̄.5 | 45 | T.1 | 30 | °T.11 | 08 | 2 | 48 |
| T3 | 52 | 6 | 47 | 4 | 39 | 6 | 11½ | 4 | 9.00 |
| °T.5 | 57 | T̄6 | 52 | 5 | 48 | °T4 | 16 | 5 | 12 |
| 1 | 7 00 | T̄.3 | 54 | 6 | 57 | T3 | 19 | 6 | 24 |
| °T6 | 05 | T̄.7 | 59 | 1 | 2.06 | °T5 | 24 | 1 | 36 |
| 2 | 07 | 1 | 9.02 | 2 | 15 | 1 | 27 | 2 | 48 |
| °T7 | 12 | T̄8 | 09 | 3 | 24 | °T6 | 31 | 4 | 10.00 |
| 3 | 14 | 2 | 12 | T.1 | 33 | 2 | 34½ | 5 | 12 |
| °T.8 | 18½ | 3 | 20 | 4 | 42 | °T7 | 39 | 6 | 24 |
| T.1 | 20½ | 4 | 30 | 5 | 51 | 3 | 42 | 1 | 36 |
| °T.9 | 25 | 5 | 40 | 6 | 3.00 | °T.8 | 46 | 2 | 48 |
| 4 | 27 | 6 | 50 | 1 | 09 | T1 | 49½ | 4 | 11.00 |
| °T.10 | 32 | 1 | 10.00 | 2 | 18 | °T.9 | 54 | 5 | 12 |
| T.2 | 34 | 2 | 10 | 3 | 27 | 4 | 57 | 6 | 24 |
| °T.11 | 38½ | 3 | 20 | T1 | 34½ | °T10 | 6 01 | 1 | 36 |
| 5 | 40½ | 4 | 30 | 4 | 43 | T.2 | 04 | 2 | 48 |
| °T.4 | 45 | 5 | 40 | T.2 | 49½ | °T.11 | 08 | 4 | 12.00 |
| 6 | 47 | 6 | 50 | 5 | 57 | 5 | 12 | 5 | 12 |
| °T.5 | 51½ | 1 | 11 00 | 6 | 4 04½ | 6 | 19 | 6 | 24 |
| T.3 | 53½ | 2 | 10 | T.3 | 12 | T.3 | 26 | 1 | 36 |
| °T.6 | 58 | 3 | 20 | °T.4 | 16 | 1 | 33 | | |
| 1 | 8.00 | 4 | 30 | 1 | 19½ | 2 | 42 | ~OWL.~ | |
| °T.7 | 05 | 5 | 40 | °T.5 | 23 | 3 | 51 | ONE·MAN CAR | |
| 2 | 07 | 6 | 50 | 2 | 27 | 4 | 7.00 | 3rd & Alder. | |
| °T.8 | 12 | 1 | 12.00 | °T.6 | 31 | 5 | 10 | T.6 | 1.00 |
| 3 | 14 | 2 | 09 | .3 | 34½ | 6 | 20 | T.6 | 2.00 |
| T̄.9 | 18½ | 3 | 18 | °T.7 | 39½ | T.3 | 29 | T.6 | 3 00 |
| T̄.1 | 20½ | T.1 | 27 | T1 | 42 | 1 | 38 | T.6 | 4 00 |
| T̄.10 | 25 | 4 | 36 | °T.8 | 46 | 2 | 48 | T.6 | 5.00 |

° = To 30th & Alberta Sts. only.
T = Tripper.
‾. = To Barn.

Form of Inspector's Time-Table Given to Patrons When Exact Information on Schedules Is Needed



Buses and Cars of the Union Street Railway, New Bedford, Mass., Connect at Lunds Corner

# Bus Line Connects Rail Termini

### Route Operated by Union Street Railway, New Bedford, Carries Three Distinct Loads on Each Half Trip

ALMOST exactly thirty years after the inauguration of electric car service in the city of New Bedford, Mass., the Union Street Railway commenced bus operation. On Dec. 18, 1923, service was started on a route beginning at the terminus of the North Fairhaven car line proceeding north to a point known as the Parting Ways, and then turning west toward Lunds Corner. At this point the bus line makes connection with another railway line. From Lunds Corner the bus route continues west to Acushnet railroad station. Half-hourly service is provided throughout the day between North Fairhaven and Acushnet. During the morning rush hour, at noontime, and after 5 p.m. all trips continue beyond Acushnet to Shawmut Avenue.

An interesting feature of this route is that the buses carry three distinct loads on each half trip. Leaving North Fairhaven, the first load is composed of people who have come out from the city on the North Fairhaven car line. They take the bus to continue to points beyond the rail terminus. Such riding constitutes the bulk of the traffic between this point and Parting Ways. From the latter place to Lunds Corner the traffic is composed of people inbound to the city who wish to transfer to the trolley at that point. After passing Lunds Corner the character of the riding changes again, people who have come out from New Bedford on the Purchase Street car line using the buses to proceed to points west of Lunds Corner.

The Union Street Railway now has three buses, two Whites and one Mack. Only two are required for operation. The exterior color scheme of the buses is similar to that of the street cars. The interiors are provided with leather upholstered cross-seats, electric lights, ventilators, buzzers, and Hunter signs. The doors are manually operated. The seating capacity is twenty-five passengers. A Rooke automatic register is used for fare collection, but instead of being held by the operator it is placed in a specially designed stand, similar to that described in ELECTRIC RAILWAY JOURNAL for June 23, 1923, page 1048. The fare on the bus is 5 cents as on the street car, and no transfers are interchanged between buses and cars.

Bus operation is in charge of one of the company's most experienced trainmen. Under his instruction a number of other trainmen have learned to run these vehicles. Bus drivers wear the same uniforms as motormen and conductors on the cars.

The Bus Route Begins Where the Rail Route Ends at North Fairhaven

# What Railway Operators Can Do to Improve Traffic Conditions*

**Various Suggestions Made for Speeding Up Movement of Cars, Such as More Effective Mechanical Equipment and Faster Interchange of Passengers—Both from Business Interest and for Ability to Help, Railway Men Should Take Part in Traffic Relief Study**

*By Howard F. Fritch*

Assistant General Manager Eastern Massachusetts Street Railway, Boston

GENERALLY speaking, every large city in broad districts, every moderate sized city in and about the center, every town at least on Main Street and even every village at the crossroads has a traffic problem these days. Fundamentally, as I see it, the first and most important problem is to get the most benefit possible for the maximum number of people from the existing streets and, second, to arrange for additional street space if the existing space is inadequate or to plan for it if indications are that present facilities will become inadequate. I do not intend even to touch upon the second phase of the problem, the existence of which has resulted in the consideration and building of subways, elevated lines, double decking of streets, street widening, cutting of new streets and other very expensive projects.

The first phase is one which is of greater interest to those of us who operate in towns and in cities of up to about 250,000 population. In view of the fact that the greater part of our business is carried on in the streets, and that it is absolutely essential to the proper performance of our service that we carry our passengers through the streets with safety and dispatch, we not only should but must give heed to the problem of traffic regulation.

The character of the traffic has almost entirely changed in the last fifteen years. The relative volume of the various kinds of traffic varies considerably in different cities, but some counts taken in a large Eastern city show the following percentages of each type in and out of the business district: Pleasure automobiles were 50 per cent of the total; commercial automobiles, 24 per cent; street cars, 14 per cent; buses and taxicabs, 3 per cent; horse-drawn vehicles, 9 per cent; or in all 77 per cent of the total were motor vehicles. The 14 per cent which was street cars is probably not very different from the number of street car movements in the same streets fifteen years ago, and the cars themselves, while they have been improved, have not changed radically in many of their essential characteristics. This should cause the operator of street cars to consider carefully whether he is doing everything he can to adjust his methods of operation to the changed traffic conditions with which he is surrounded.

There has been a great change in the speed of vehicles relative to the speed of the street car in the last 15 or 20 years. Then, our companion vehicles in the street were the horse-drawn buggy, express wagon, tip cart and dray. Now there are a few of the last three, but many more auto trucks and seemingly countless passenger automobiles. Not only has the number of vehicles increased, but where formerly the speed was less than that of the street car, now for many of the units it is greater. This condition presents new problems with respect to safety and method of operation.

The quickly moving automobile has brought about a very serious accident problem for us. The speed with which it can come out from an intersecting street, turn out from the curb, swing over into the path of a car or stop calls for the utmost of alertness on the part of the car operator, efficient brakes and proper apparatus for warning signals.

## ATTENTION TO SAFETY A NECESSARY PRELIMINARY

Much good can be done by informing motormen of the dangerous street intersections by spotting accidents on a map. New employees and old employees both should be carefully instructed in the proper method of handling their cars in traffic so as not only to avoid hitting other vehicles, but to try in every reasonable way to anticipate the movements of automobiles and keep out of accidents which might be entirely the fault of the other party. The adequate use of the bell and whistle should be insisted upon, and whatever device is used should be suited to present-day conditions, having in mind that the motor vehicle is probably traveling something like three times as fast as the former horse-drawn vehicle.

The present-day traffic conditions require new methods for protecting persons who desire to board our cars and for passengers after they leave the cars. It is our duty to make the movement between the sidewalk and the car as safe and convenient for our passengers as possible. With this purpose in mind we should try to arrange our stopping places on the side of the intersecting street which will be most convenient, where necessary should have cross-walks striped or marked and safety zones marked or set apart by barriers where conditions warrant.

I believe that one of the greatest hazards in traffic today is the automobile driver who is inadequately trained or who is physically or mentally not equipped to handle a motor vehicle. I believe it would be very much to the advantage of all users of the highway if periodical examinations were required of all drivers of vehicles to make certain that they were proper persons to be operating a vehicle.

The street car, compared with other vehicles, is a very efficient user of street space, considered upon the basis of space in the street occupied per passenger. On the same basis, the passenger automobile is extremely inefficient, and this fact is one of the large reasons for our present-day traffic congestion. As the two vehicles are ordinarily loaded in the rush hour, the passenger in the automobile takes up something like ten times the street space that the car passenger requires. This is not realized or perhaps even thought of generally by the public, and in fact, common impression is that the street car slows up and interferes with traffic. It is slower moving than the passenger automobile, which has something like 20 hp. per passenger compared with 2 hp. per passenger in the rush-hour street car, and the car stops frequently for interchange of passengers, while the automobile is running express from one end of its run to the other. However, the fact that our cars are moving in such company makes it very desirable, in order to reduce traffic congestion and at the same time to promote our own business, that we speed up our operation in every way possible consistent with safety.

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*Paper presented before New England Street Railway Club, Boston, May 22, 1924.

### MODERN MECHANICAL EQUIPMENT NEEDED

To this end our cars should be equipped with brakes capable of giving a quick stop. We have had "four-wheel brakes," in fact eight, for several decades. Our cars should be motored and geared to accelerate rapidly with other traffic. The doors and steps should be designed so that passengers may board and alight quickly. Passageways on the platform and in the car should be carefully laid out so as to facilitate passenger interchange. This is an especially important and difficult problem on the one-man car, where ordinarily the interchange is at one door. In some instances the rear door has been used successfully to expedite the interchange of passengers on one-man cars, especially at transfer points. This practice requires the use of remote control of the rear door, and consequently great care on the part of the operator to make sure that passengers are clear of the door before it is closed. However, experience has shown that it is practicable and safe and also aids in getting passengers better distributed through the car. In some cases the use of the rear door has been in conjunction with turnstile control of the flow of passengers.

### FARE COLLECTION CAN BE SIMPLIFIED TO SAVE TIME

The method of fare collection should be so devised as to minimize the standing time. In this connection pay-as-you-enter on inbound trips and pay-as-you-leave on outbound trips have been found to be very successful, particularly with one-man operation. Through this plan fares are collected as small groups of passengers board on inbound trips and leave the car on outbound trips, and no fares are collected while the heavy interchange is taking place in the center of the city and where delay is usually the most to be avoided. Much standing time can be eliminated by the selection of the proper form of fare so as to eliminate unnecessary delay in making change or selling tickets. Generally the collection of odd penny fares from the majority of passengers is to be avoided and the collection of a ticket or token to be preferred. However, it is desirable that the tickets be sold, if they are to be sold on the cars as is usually the case, in as large a unit quantity as possible so that the sales transaction will not have to take place too often.

Our schedules should be so arranged that crews will relieve one another at times and places where it can be done quickly and so as not to delay other street traffic or our own passengers.

Above all, we should not have a car standing still unnecessarily in traffic with the folding doors open and so hold back the automobile driver who is a respecter of the 10-ft. clearance law. This practice does much to destroy good will and promotes a strong inclination to ignore the law and run by.

Experience in many cities has shown that changes in the routing of cars may be made not only to the advantage of the street car service, but also in such a way that general traffic conditions will be improved. Elimination of left-hand turns through traffic, unnecessary crossing of heavy streams of traffic and the elimination of unnecessary movements of empty cars should be given study.

Up to this point I have been speaking of the things we can do ourselves to expedite the movement of our cars to the general benefit of traffic and to the improvement of our service, independent of any traffic regulations which may be imposed by the local authorities. Most every city has some traffic regulations. It is not only fitting, but desirable, that the street railway men take an active interest in their formulation. We should go about this in a diplomatic and helpful attitude and should try to consider reasonably all the users of the street. Usually the local authorities welcome assistance in these matters if we can demonstrate that we are not entirely interested from self-serving motives. We are experts in street transportation and should be able to help. Traffic regulation is a relatively new subject, still in the developmental stage, and before practices detrimental to our interests become crystallized, it is desirable for us to give the matter our attention.

After traffic regulations are established we should do everything in our power to see that they are enforced. Altogether too often rules are established and traffic signs posted only to be entirely ignored by those who are supposed to be regulated and by those who are supposed to enforce them. Such regulation is, of course, no regulation and only promotes disrespect for all rules and laws. Regulations should mean every word they say and should be enforced accordingly.

My attention was called only the other day to a rule in a certain city requiring vehicles to come to a full stop before making an important street crossing. It is seldom that any one stops, and the officer usually stationed at the crossing does not expect a stop to be made. Of the same character is the common "Street closed, no passing" sign. A good part of the time it does not mean what it says, so it is too often disregarded and encourages disregard of other signs.

The commonest and one of the most important traffic regulations is that regarding parking. Just recently I saw it stated in the press that as long ago as 1880, Schenectady, N. Y., had traffic regulations which imposed a six-hour parking limit. Some of our communities have not advanced far beyond this stage, much to the detriment of traffic in general.

### KEEP THE STREET CLEAR FOR MOVING VEHICLES

A street is intended fundamentally as a means of communication and not for storage. There is no more reason why the street should be used for storing vehicles than for any other private purpose. Private property can be used for the storage of vehicles, but cannot ordinarily be used as a substitute for the traveled way. Therefore, when the street becomes congested through the presence of parked or stored vehicles, the cure should be obvious. Experience shows, however, that much opposition is likely to develop from the merchants along the street where it is proposed to restrict or eliminate parking. The merchant's attitude is that the parking regulation should apply to every other place of business, but his customers must be allowed to park at the door. It is obvious that such a policy carried to its conclusion would permit unrestricted parking and completely tie up traffic, much to the detriment of all merchants. We recently had a case where it was necessary to stop street cars outside the retail shopping district on the day of a big sale, as a result of a previous experience when unrestricted parking had been permitted during a similar sale and traffic was completely paralyzed.

### STREET CAR IS MOST EFFICIENT USER OF STREETS

All statistics I have ever seen show a much larger number of people carried in and out of the business district in the street cars than in automobiles. Such statistics for a given city should be very helpful in persuading merchants of the desirability of reasonable parking regulations for the good of their own business. We are interested, particularly, in having parking so regulated as to allow room for a stream of vehicles alongside our tracks rather than confined to our tracks. In some of our narrow New England streets this is impossible. I know of a case where the street is so narrow that unless the vehicle is stopped very close to the curb, it is impossible for a street car to pass. In one such case a line was painted on the paving parallel with the curb within which vehicles must stand. This was of great help to the street railway in avoiding accidents and speeding up car movements, and all traffic was benefited. An interesting experiment has recently been tried in Philadelphia where on certain streets with heavy street car traffic all other traffic has been barred from the track zone as an aid to speeding up car traffic.

The establishment of one-way streets is often helpful, and when we can so arrange our operation as to conform to this, it is likely to be to our advantage.

The segregation of traffic by types is not often practiced except in the larger cities. This is only possible where parallel streets are available. It is obvious that the movement of the faster vehicles will be speeded up if they can be put on one street and the slower moving commercial vehicles limited to others. If segregation on different streets cannot be practiced it is highly desirable and feasible to insist that the slower moving vehicles keep closest to the curb where there is room for more than one stream of traffic in either direction. The old custom has been, at least in the medium-sized cities, to route all street cars by a given point. As general traffic increases this becomes undesirable, and the splitting up of traffic movements on to a number of streets will do much to relieve congestion at the most critical point.

### TRAFFIC SIGNALS MUST BE EMPLOYED WITH JUDGMENT

It is only in the last few years that the general use of traffic policemen has been necessary at important street intersections. All sorts of lighting and semaphore control apparatus is being experimented with to supplement or replace the officers, but so far such devices have not come into general use in the cities such as we operate in. However, the proper functioning of the traffic officers and the co-ordination of the acts of a number of them along the length of an important street are of great importance for the satisfactory movement of our cars.

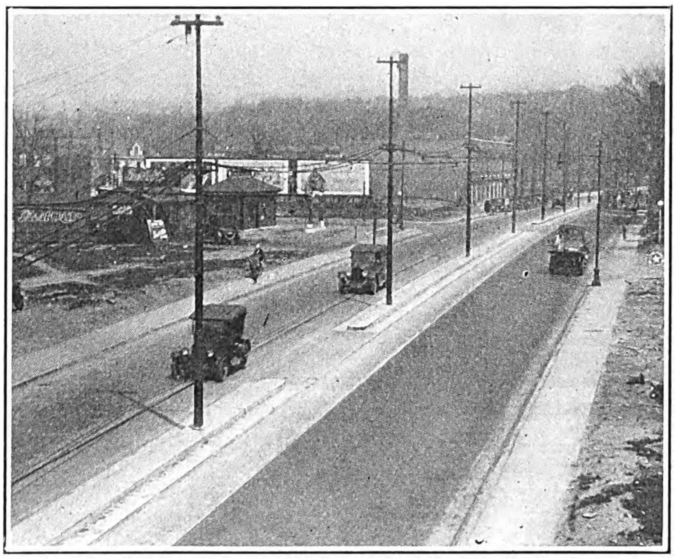
Arbitrary automatic control by signals seems to be inefficient as it must of necessity disregard the conditions at any particular crossing at a given moment. This results in unnecessary waits at crossings which are clear. Control by an individual at the particular point seems so far to be the most satisfactory except in some very special cases. Much thought and study are being given by experts to the matter of proper time intervals of stop and go in order to get the maximum traffic by in each direction in a given time. It seems that short intervals between change are more efficient than long periods. We should see that our car crews pay strict attention to the orders of the traffic squad, and when their method of control does not seem to us to be the best we should suggest corrections to the proper authorities. Again, as I have said before, we have a right to be interested, and our views if carefully thought out are worthy of attention.

In conclusion, we should first make certain that we are doing everything possible to eliminate delays caused by our cars and use our ingenuity to expedite their movements. We should then also enter actively into local activities for regulating traffic, and as experts in street transportation matters our views can be of great benefit to the community and to our industry.

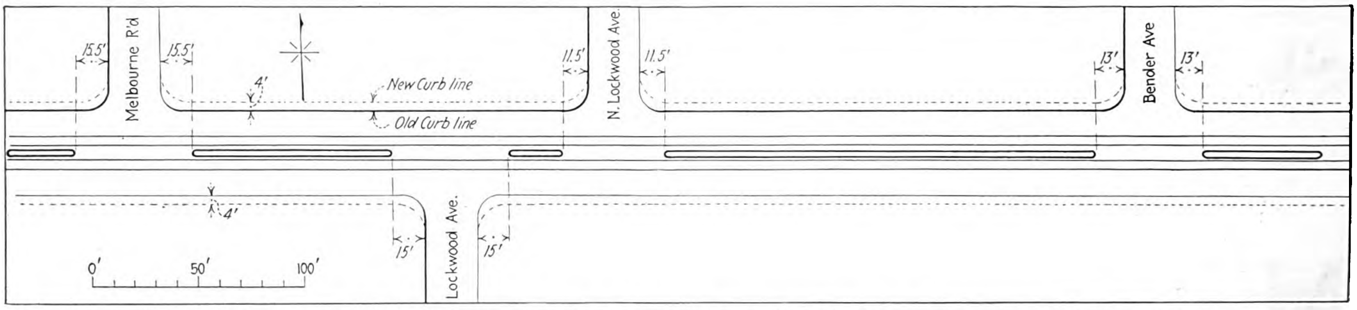
# Center Poles for Narrow Street

### Cleveland Railway Puts 6-In. Curbing 30 In. Wide in the Middle of a Street to Protect Center Pole Bases from Automobiles

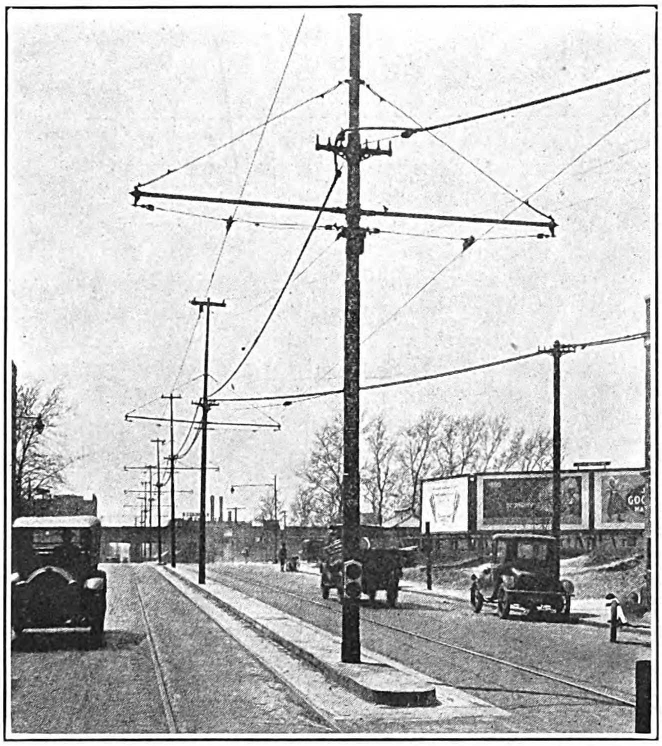
THE Cleveland Railway had recently to solve a novel problem in street planning. Vehicular traffic had increased greatly on Superior Avenue in East Cleveland, a suburb of Cleveland, and it became imperative to widen the roadway. The only way that this could be done was to take the desired width from the sidewalks on each side. This the authorities decided to do, and by taking 4 ft. off each sidewalk 8 ft. was added to the roadway, increasing it from 40 ft. to 48 ft.



A Center Curbing 30 In. Wide and 6 In. High Is Placed Between the Tracks



**Plan of Portion of Superior Avenue, Showing How the Street Was Widened and Center Curbing Installed**



**Appearance of Superior Avenue, East Cleveland, After the Roadway Was Widened and Center Poles Installed**

The Cleveland Railway has a double track on the street. The overhead contact wires for these tracks, before the change in street width, were suspended by means of span wires from side poles set in the sidewalks. The change in the curb line made necessary a change in overhead construction. The simplest plan, of course, would have been a relocation of the poles 4 ft. nearer the building line on each side, but this appeared objectionable on account of the narrowness of the sidewalk.

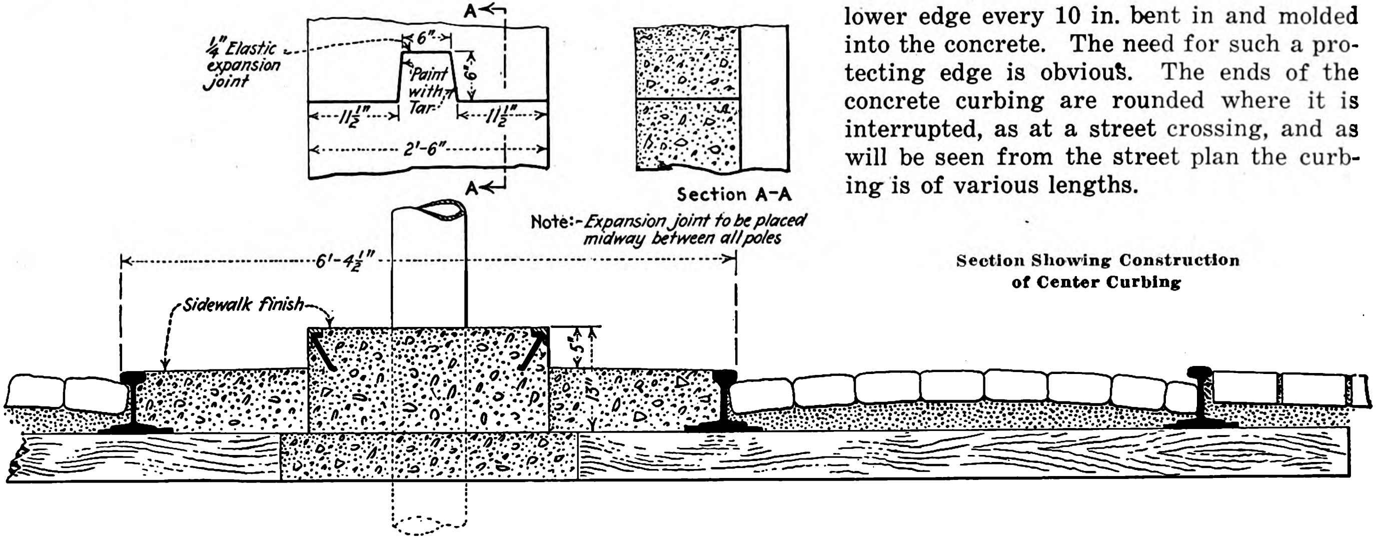
The only other possible plan was a line of center poles. It was figured that with the gain of 8 ft. in street width sufficient space in the center of the street might be taken for such a line of poles, and the spacing of the tracks was sufficient to permit their installation. It was, however, feared that a line of center poles would be dangerous to automobile traffic. Automobiles passing each other might collide directly with these poles, or if this did not occur it was feared that some drivers, believing themselves at a safe distance from the poles, would nevertheless hit them with their mud guards or axle caps. If this was done, the automobile might be swerved from its course and a serious accident occur.

### CENTER POLES WITH GUARD CURBING ADOPTED

The company finally thought of the expedient of carrying a guard curbing 30 in. wide from pole to pole except at cross streets. With a pole base 8 in. wide and the center curbing or platform 30 in. wide there is no danger of the poles being hit by projecting parts of passing automobiles. At the same time a space 30 in. wide and 6 in. high in the center of the street does not take up any useful space because the space between the wheels of two lines of automobiles going in opposite directions should be at least this distance apart. Six inches was selected as the height of the curbing as being high enough to keep wheels from mounting it, but low enough to be cleared by fenders and mud guards.

### EDGES ARE PROTECTED

This curbing is of concrete with steel protected edges. The protection consists of a steel channel, 2 in x 2 in., with a strip or tooth on the lower edge every 10 in. bent in and molded into the concrete. The need for such a protecting edge is obvious. The ends of the concrete curbing are rounded where it is interrupted, as at a street crossing, and as will be seen from the street plan the curbing is of various lengths.


A
¼" Elastic expansion joint
6"
6"
Paint with Tar
11½"
11½"
2'-6"
A
Section A-A
Note:- Expansion joint to be placed midway between all poles
6'-4½"
Sidewalk finish
5"
13"

**Section Showing Construction of Center Curbing**

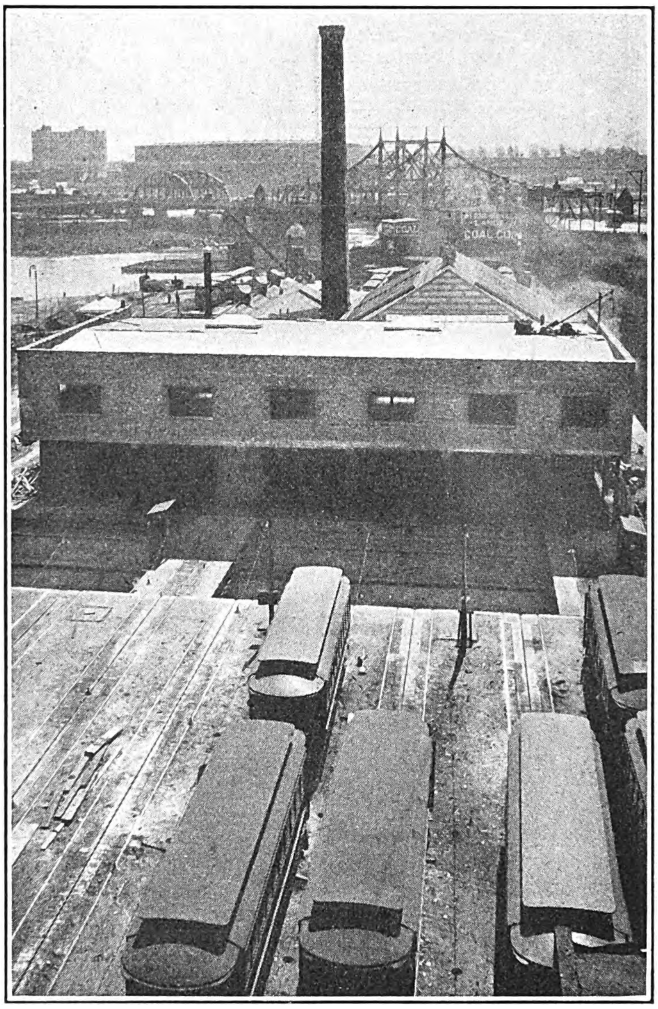
# Shop and Storage for Eighth Avenue Road

### New York City Line Rebuilds Old Foundry for Repair and Inspection Shops—Storage Yard for Cars Is Without Special Trackwork on Account of Expensive Conduit Construction—Transfer Tables Used as Substitute—New Type of Slot Track Construction

MODERN storage and maintenance facilities have been provided at the new shops and yard of the Eighth Avenue Railroad, New York, at 155th Street and Eighth Avenue, on a plot of ground 200 ft. x 625 ft. An old foundry on the property has been remodeled by constructing a new roof, a floor with tracks and pits, and two additions to the building. The adjoining space has been converted into a car and materials storage yard with transfer tables at each end of the shop building for serving the twelve tracks. Four of the tracks pass through the building, where pits are located for inspection and repair work. Three tracks pass to the north of the building and extend practically the full length of the yard. Two inspection pits are located under the two yard lead tracks in front of the shop. The track and layout have been designed with a view toward construction economy, transfer tables being used instead of special trackwork, and a reinforced concrete track construction for the underground conduit system rather than the usual cast-steel yoke construction.

The two old foundry buildings had low walls, one of which was common to both, and high gable roofs covered with slate. Due to the condition of the roofs, the slate was replaced with a plank roof and covered with roofing paper. Openings suitable for admitting cars were cut in each end of the larger building opposite four of the tracks and provided with swinging wooden doors. The portion of the larger building occupied by tracks 1 and 2, which are used for inspection purposes, was given a concrete floor laid with the surface 9 in. below the top of the rail, and with ramps at each end of the building. The pits extend under each track the entire length of the building and are 5 ft. deep. Tracks 3 and 4 are separated from 1 and 2 by a partition and are used for overhaul work. The concrete floor of this portion of the building is laid even with the rail. At the west end of track No. 3 a Columbia car hoist has been provided. Directly opposite on track No. 4 are two armature pits with hydraulic lifts, while at the other end of the building two transverse pits 15 ft. apart connect the service pits under the tracks.

The pit construction is of concrete with the track carried on a shoulder which projects into the pit. This shoulder slopes back into the wall, leaving the base of the pit as wide as the track gage. Lamp recesses spaced every 5 ft. are located in the shoulder under the rail. At the ends of each pit are receptacles for attaching a double-conductor jumper cable for supplying the car with power, while it is over the pit. A receptacle on each side of the car receives the other end of this cable. A similar arrangement is used in the front yard for supplying the cars on storage tracks with power for lighting and operation. In this case one end of the cable is attached to a hand plow which is inserted in the slot of either yard lead track. Each pit has a drain trough which leads into a sump. This pit construction cost approximately $30 per linear foot.

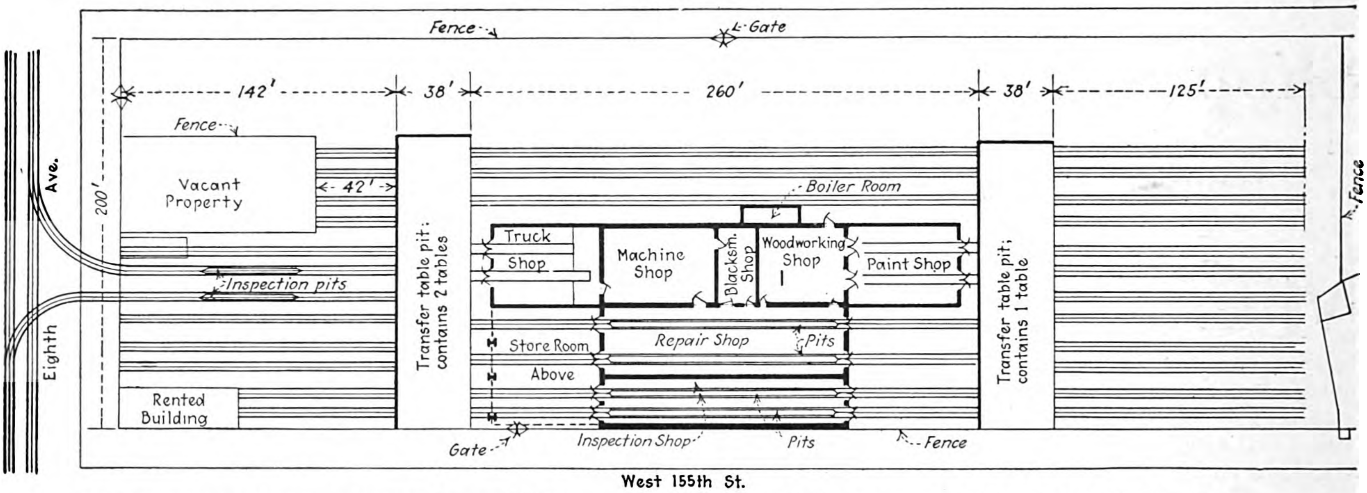


Rebuilt Foundry and Additions Form New Shop for Eighth Avenue Line, New York

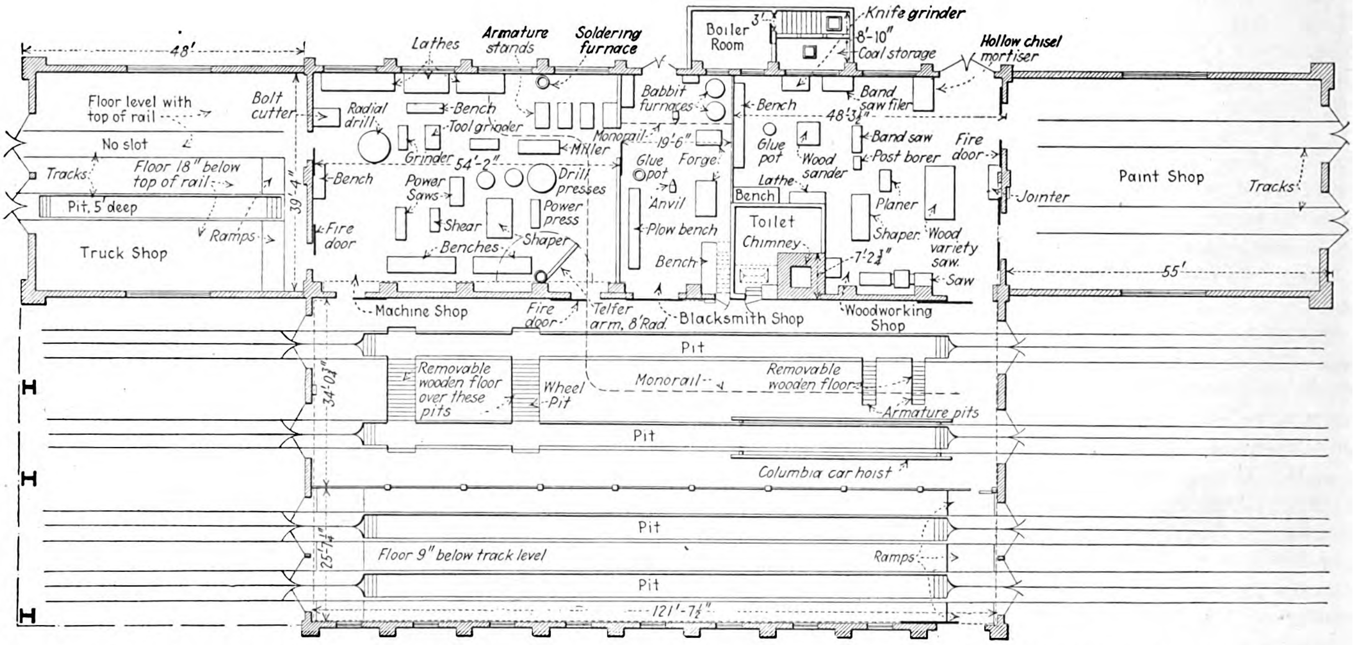
In the smaller building partitions divide the area into three parts, providing for a machine shop, blacksmith shop and carpenter shop. A wood block floor, skylights and ventilators in the long gable roof help to make the place suitable for this class of work.

As the old buildings were too small, a two-story building has been added to the front of the smaller building, extending between it and the transfer pit. The second floor of the addition has been extended over the four shop tracks in front of the larger building. The lower floor is used as a truck repair shop, while the entire second floor is occupied by the storeroom. A freight elevator serves this upper floor. Two tracks, without power facilities, enter the truck shop from the transfer pit and are used for wheels and trucks. A wheel lathe and wheel press are mounted along the north wall of the building. A concrete floor with the surface 18 in. below the top of the rail facilitates truck repair work.

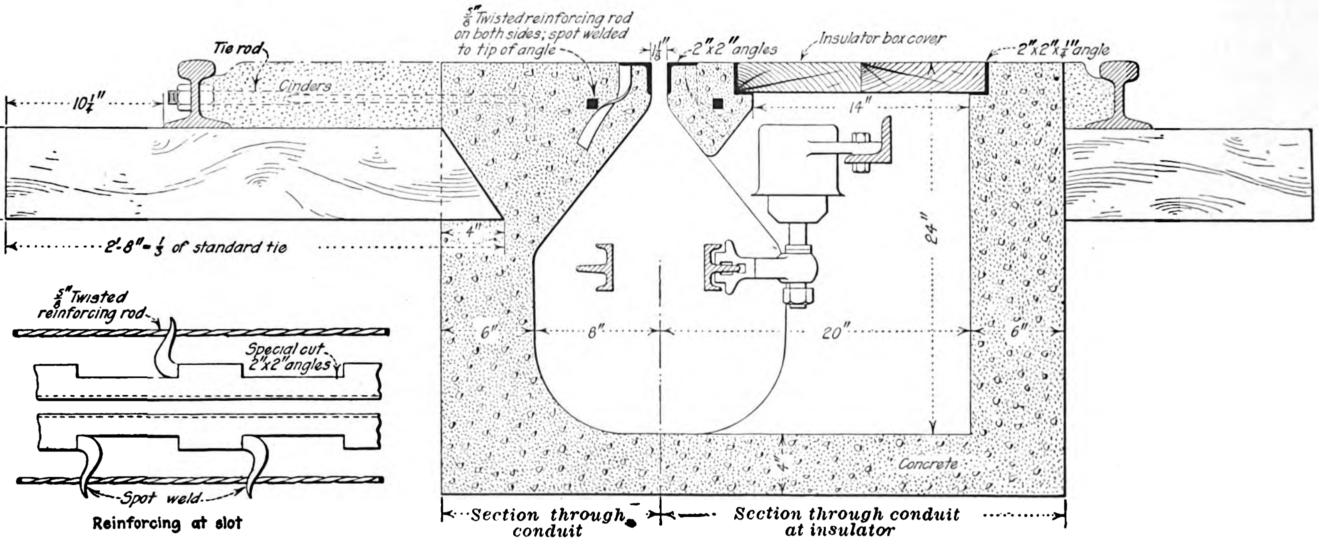
Another addition has been made to the rear of the small original building. This is of one-story brick construction with arched truss roof. Two tracks, without


Fence
Gate
142'
38'
260'
38'
125'
Fence
Eighth Ave.
200'
Vacant Property
42'
Inspection pits
Rented Building
Transfer table pit: contains 2 tables
Boiler Room
Truck Shop
Machine Shop
Blacksm. Shop
Woodworking Shop
Paint Shop
Store Room Above
Repair Shop
Pits
Transfer table pit: contains 1 table
Fence
Gate
Inspection Shop
Pits
Fence
West 155th St.

**Track Layout at Shop and Storage Yard of Eighth Avenue Line, New York. Use of Two Transfer Tables Eliminates Expensive Special Trackwork**


48'
Lathes
Armature stands
Soldering furnace
Boiler Room
3'
Knife grinder
8'-10"
Coal storage
Hollow chisel mortiser
Floor level with top of rail
Bolt cutter
Radial drill
Bench
Tool grinder
Babbit furnaces
Bench
48'-3¼"
Band saw filer
No slot
Grinder
54'-2"
Miller
Monorail
19'-6"
Band saw
Post borer
Fire door
Tracks
Floor 18" below top of rail
39'-4"
Bench
Power Saws
Drill presses
Glue pot
Forge
Anvil
Glue pot
Wood sander
Lathe
Bench
Planer
Jointer
Paint Shop
Tracks
Pit, 5' deep
Shear
Power press
Toilet
Chimney
Shaper
Wood variety saw
Ramps
Fire door
Benches
Shaper
Plow bench
Bench
7'-2½"
Saw
55'
Truck Shop
Machine Shop
Fire door
Telfer arm, 8' Rad.
Blacksmith Shop
Woodworking Shop
Pit
Removable wooden floor over these pits
Wheel Pit
Monorail
Removable wooden floors
Armature pits
34'-0½"
H
Pit
Columbia car hoist
H
Pit
25'-1¼"
Floor 9" below track level
Ramps
Pit
121'-7½"
H

**Layout of Machine Tools and Equipment in Eighth Avenue Shop Made with a View Toward Grouping the Machines for a Particular Class of Work**


⅝" Twisted reinforcing rod on both sides; spot welded to tip of angle
1⅛"
2"x2" angles
Insulator box cover
2"x2"x¼" angle
Tie rod
Cinders
10¼"
14"
6"
2'-8" = ⅓ of standard tie
4"
24"
6"
8"
20"
6"
Concrete
⅝" Twisted reinforcing rod
Special cut 2"x2" angles
Spot weld
Reinforcing at slot
Section through conduit
Section through conduit at insulator

**Design of Yard Track Which Is of Reinforced Concrete and Costs Approximately One-fifth That of Standard Road Track for the Conduit System**

conduits, enter this building from the rear transfer pit. This addition is long enough to house one car on each track and is used as the paint shop. A concrete floor with drain has been provided.

The general layout of the buildings, showing the location of machine tools and other equipment, is shown in an accompanying illustration. Where possible the machines were placed to simplify the handling and to expedite repair work. Machine tools were grouped according to the class of work to be done. A monorail with two electric hoists serves those machines to which heavy work is assigned. This monorail extends into the general overhaul section and aids in moving armatures from the cars to the machine tools used in armature work.

Six Baetz patent heaters are used for heating the shops. These contain steam coils over which air is blown by a belt-driven blower. The air is taken in at the top and discharged at the bottom through two discharge ducts. Each heater is located so that the discharge ducts are approximately 7 ft. above the floor. By placing the heater adjacent to a dividing wall and making an opening in the wall for one discharge duct, it is possible to heat two sections of the shop with one heater.

### NEW TYPE OF TRACK CONSTRUCTION USED

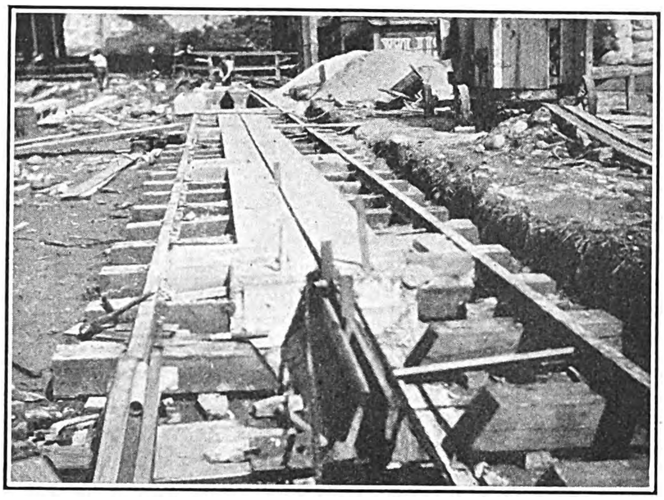
A type of track construction is used throughout the yard which differs from that employed in street construction. The usual construction consists of cast-iron yokes every 5 ft. with a steel guide for each side of the slot. It costs approximately $386,000 per mile. This type of construction was not necessary in the yard, where there is no vehicular traffic. The substitute type, while permanent and sufficiently strong, is unsuited for street construction because it cannot be repaired with satisfactory results, but it is entirely suitable for use on the company's private property.

The yard underground conduit construction is of solid concrete, reinforced at the slot by a special cut angle and a twisted reinforcing rod. The lower part of the conduit is poured in the shape of an open trough with a width of 16 in. and a depth of 8½ in. The bottom is 4 in. thick and has a slope toward the transfer pits of 1 per cent. This permits draining into the transfer table pits, doing away with the necessity for frequent cleaning of the conduit.

After the open trough concrete has set, a triangular wooden form is mounted above the trough on temporary pins so that the base of the form is at the top of the open trough. Concrete is filled in against this form from both sides, bringing the outer side walls up vertically. The slot is formed by two 2-in. x 2-in. angles set with the vertical faces 1⅛ in. apart and the top faces exposed. Lips 1 ft. apart are cut out of the top face of the angle and are twisted and bent laterally and downward to form an anchorage in the concrete. Near the end of this lip a ⅝ in. reinforcing rod is spot-welded. This construction makes the edge of the slot a reinforced concrete beam of the cantilever type, capable of carrying all loads which may be imposed in the yard.

The short ties and tie rods are placed before the final pour of concrete is made and are held in position by the concrete. The inside ends of the ties are chamfered so that any movement of the tie caused by the weight of the rail and car will not break away the concrete.

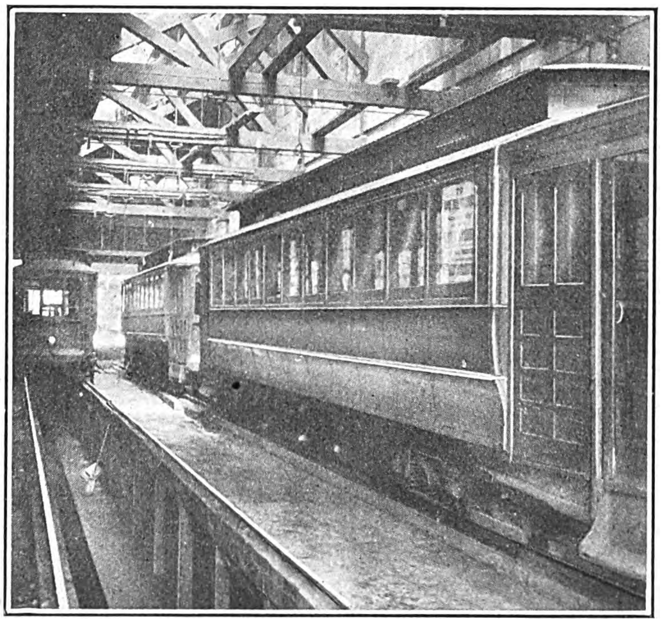
This type of construction costs $13 per foot or approximately $68,640 per mile, if figured on a mileage basis. The entire track laid in this instance, including pits, was only 3,500 ft.



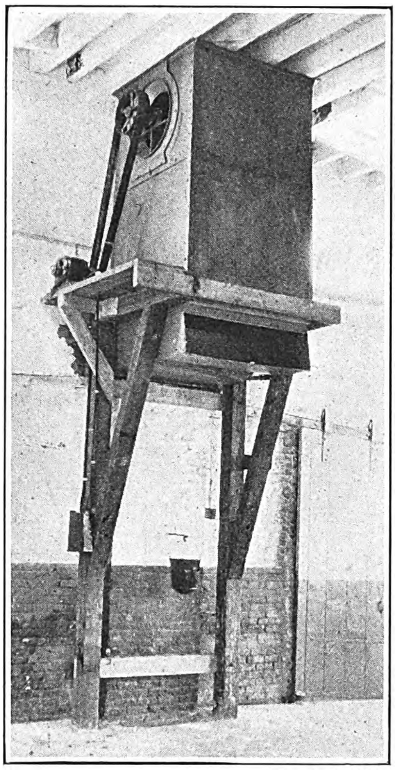
**Conduit Track in Yard in Course of Construction. The Triangular Form Is Mounted Above the Open Trough and Holds the Specially Cut Angles at Its Upper Edge. Chamfered Ties Prevent Breaking Away of Concrete**

For the transfer tables, two pits 150 ft. long with three rails are provided. These pits have a concrete floor with a longitudinal "hill and valley" construction for drainage purposes. The rails are supported on the ridges and the floor slopes to the trough between the rails, allowing snow to be pushed into the valleys if it should rise above the 9 in. rails. Two tables have been provided in the front pit, while there is one in the rear pit.

In this track layout, all tracks, with the exception of the two leads from the street into the yard, are without power. However, a track may be given power by aligning the transfer table with it and closing two circuit breakers located on the table. The conductor rails on the transfer table are "alive" at all times. When the transfer table is aligned with a track, two shoes at the end of the table connect with the conductor rails of the station track. The shoes may be energized by closing the circuit breakers on the table. These two



**The Surface of the Floor in Inspection Shop Is Laid 9 In. Below the Top of the Rail, with Ramps at Each End of the Building**



Six Heaters of This Type Are Used to Heat the Shops. Air Is Drawn In at the Top and Blown Over Steam Coils and Discharged at the Bottom

breakers, one for positive and one for negative, are tripped when the table is moved, preventing power being applied to the conductor rails of a track as the table passes by. The practice of having the rail dead at times when not in use is in compliance with the National Bureau of Fire Underwriters' ruling. According to its insurance regulations, cars in storage are not to be connected to the power conductor. As it is impracticable to remove the collecting device from the conductor rail in an underground conduit system, it was necessary to cut off the power from the rail.

A portion of the yard and the blacksmith shop will be used by the way and structures department. Supplies will be stored and the general work connected with that department done at this location.

The entire rebuilding program for the yard and shops represents an expenditure of approximately $120,000, exclusive of property cost.

# Improving Voltage with a Booster

### The Bangor Railway & Electric Company Installs Semi-Automatic Booster for One Long Suburban Route at Less Cost than for Extension of High, Tension Power Line and Construction of Automatic Substation

By A. L. Davis
Electrical Engineer Bangor Railway & Electric Company, Bangor, Me.

The booster, which formerly was used quite widely on electric railway lines for improving voltage on long feeders, has fallen into disuse since the development of the automatic substation, operating directly on the high-tension power system. Occasionally, however, a machine of this type can be installed to considerable advantage. A case of this sort is that of the Bangor Railway & Electric Company, which operates a long suburban line with relatively infrequent service and in territory where high-tension transmission lines have not been installed. Using a compound-wound direct-current generator connected in the feeder line has improved voltage conditions so that schedules are maintained better and no difficulty is experienced in plowing the heavy snows.

The company's Hampden division runs from Bangor to the town of Hampden, a distance of 7 miles between terminals. It has numerous grades, the heaviest, of 9 per cent, being about 900 ft. long at a distance of 5.4 miles from the city railway substation. The round trip consumes 1½ hours and normally two cars are used, each weighing 30,000 lb. During rush hours a third car, weighing 48,500 lb., is operated on this line. The numerous grades, and especially the one of 9 per cent, caused considerable difficulty in making schedule time For snow removal in winter it was practically impossible to transmit sufficient power to operate the plows.

The substation from which this line is for the most part fed is located near the city terminus. The voltage carried on the substation bus is 600. From the substation there are four No. 0000 feeders serving the Hampden division. These extend about 5 miles, and taper off to two No. 00 wires at the outer end of the line. The trolley conductor is No. 00 copper, with feed taps every ten poles except on grades, where the number is increased.

No power lines of sufficient capacity paralleled the railroad and the nearest transmission line was some distance away. It would have been necessary, had constant-potential conversion equipment been installed at the proper point on the line, to build a new transmission line to this point. The receipts of the division were not sufficient to warrant the expense of building the line, along with the structure and conversion equipment.

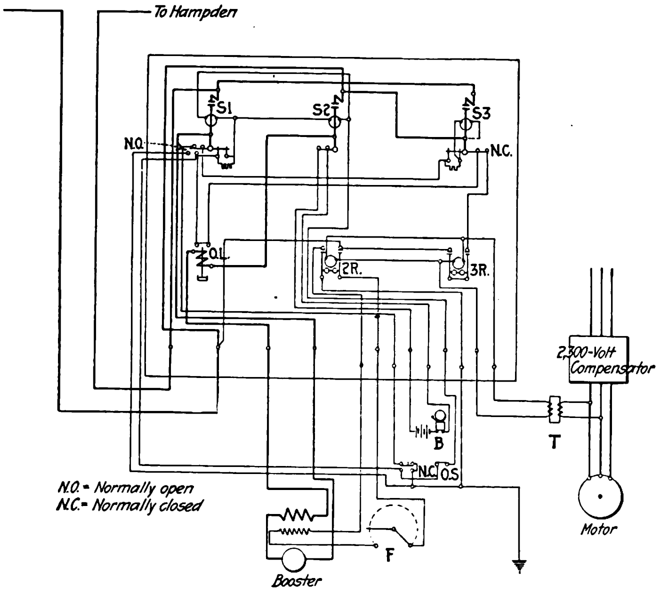
After a thorough analysis of the situation, it was decided that the installation of a booster set was most suitable for our purpose. If this booster had been placed at the most advantageous location on this division, it would have been necessary to purchase land and erect a structure for the protection of the equipment. Furthermore, full-automatic equipment would have been required. As the carhouse is located on the outskirts of the city, approximately 1 mile out on this division, it was decided that although the equipment would not be exactly at the desired point, this would be the most advantageous location, particularly as a spare room was available and some one always on duty.

The booster installed is a General Electric 75-kw. direct-current generator, driven by a three-phase 2,300-volt, squirrel-cage induction motor, operated by energy from the power line feeding the car shop. The use of alternating-current supply was decided upon so as not to subject the motor end to fluctuating voltage, as would have been the case had the trolley supply been used. The generator field is compound wound. A shunt winding excited directly by the full trolley voltage gives a constant boost to the voltage, adjustable by means of the field rheostat from zero to 50 volts. The series winding is designed to add 100 volts to the line at full load, making the total full-load boost with both windings in use 150 volts.

Since there is always some one on duty at the car house, semi-automatic control was installed. The scheme of control of this set, designed by the writer and manufactured by the Cutler-Hammer Manufacturing Company, is shown in the accompanying diagram. All operations of the booster may be controlled from one position, the only apparatus operated being the motor starting compensator, a push button controlling the contactors, and the occasional use of the field rheostat for changing the constant boost voltage.

The set is started and brought up to speed in the usual manner by means of the compensator. When the running position is reached the potential transformer for the no-voltage release coil of the compensator is excited and two alternating-current contactors on the control board, *2R* and *3R*, close as shown in the diagram. Contactor *2R* applies the excitation to the shunt field while *3R* is for the purpose of cutting out the set upon failure of the alternating-current supply. Next, pushing the button *NO* opens the contactor *S*3 on the right of the board which shunts the booster when the set is shut down, and closes the two left-hand contactors, *S*1 and *S*2, cutting the booster into circuit. To shut the set down, all that is necessary is to trip the compensator, which drops out the two main booster contactors, *S*1 and *S*2, and closes the shunting contactor *S*3.

The set is protected from overload by means of an overload trip coil *OL*, which upon operation cuts the booster away from the line and closes the shunting contactor *S*3, leaving the set running idle and ringing an alarm bell, *B*. The set can again be placed in service by merely pressing the button *NO*. It is also protected against loss of alternating-current supply voltage, overspeed or reversal, which might be caused by the loss of alternating-current supply. An inspection of the wiring diagram will render apparent the various operations. Contactors *S*1 and *S*2 are mechanically interlocked with *S*3 to prevent simultaneously opening or closing.



**Wiring Diagram of the Semi-Automatic Booster Installation of the Bangor Railway & Electric Company**

*S*1, *S*2—Booster armature contactors.
*S*3—Short-circuiting contactor.
*OL*—Overload trip coil.
*2R*—Shunt field contactor.
*3R*—A-C no voltage contactor.
*NC*—Push button to stop set.
*OS*—Overspeed device.
*T*—Potential transformer.
*B*—Bell alarm.
*F*—Shunt field rheostat.
*NO*—Push button to connect booster in circuit.

It will be noted that in any of the above operations the division is never without current from the main substation, as upon the booster set tripping out from any cause or when the set is not in use the shunting contactor allows current from the main substation to pass directly through the control panel and out upon the line.

By use of the booster method, it was possible to throw the major part of the load back to the main substation with a small amount of supply energy, the capacity of the power line feeding the car shop being ample for this purpose. The total installed cost of this equipment was $4,247.55, and it was completed Oct. 1, 1922. It has been in daily use since that time and has given no trouble.

# Fewer Accidents with One-Man Cars

### Recent Statistics from Stone & Webster Show Greater Safety with the One-Man Car and Confirm Earlier Experience

IN THE early days of the one-man car its use on a large scale was confined largely to Stone & Webster properties. During this time very important statistics on the greater safety of the Birney safety were made public through addresses and papers by members of the Stone & Webster organization, notably Henry G. Bradlee, W. H. Burke and others. These statistics showed greater safety for the one-man car, not only on the basis of passengers carried but also on that of car-miles run in spite of the less carrying capacity of the car, and were of great help in establishing the one-man car principle in other cities.

Recent statistics from the Stone & Webster organization submitted at a hearing of the Massachusetts legislative committee in Boston on one-man cars and based on nearly four years' experience of the Stone & Webster organization confirm the record of greater safety. These data were submitted by J. W. Gale and are based on city operation of twenty-two Stone & Webster companies and cover, with one exception, the period 1920, 1921, 1922 and nine months of 1923. The exception is in the injured and killed information, which is based on 1921 and 1922, 1923 data not having been compiled in this form.

ACCIDENT STATISTICS

| | One-Man Car | Two-Man Car |
|---|---|---|
| 1 Revenue car-miles operated | 74,561,600 | 66,717,300 |
| 2 Revenue passengers carried, including transfers | 388,299,400 | 487,758,500 |
| 3 Total accidents | 27,919 | 37,258 |
| 4 Total accidents per 10,000 car-miles | 3.7 | 5.5 |
| 5 Total accidents per 100,000 passengers carried | 7.2 | 7.7 |
| 6 Thousands of passengers carried per person injured or killed | 75.4 | 54.1 |
| 7 Tens of thousands of passengers carried per passenger accident | 7.1 | 3.4 |

In the accompanying table line 4, obtained from the accident and car-mile-figures given above, shows that the two-man car has 48.6 per cent more accidents on the car-mile basis than the one-man car. The next item, that of total accidents per 100,000 passengers carried shows that the two-man car has 6.9 per cent more accidents than the one-man car on the basis of passengers carried. If figured on the returns for 1921, 1922 and nine months of 1923, the ratio would be even higher, or 8.3 per cent against the two-man car.

The next item gives the thousands of passengers carried for each person injured or killed. The figures show that with the one-man cars 39.3 per cent more passengers are carried for each such accident than with the two-man car.

The next figure relates to passenger accidents, such as boarding, alighting, falling from cars, doors, gates, etc., and all inside car accidents except collisions. This shows that on an average 111 per cent more passengers are carried on the one-man car for every such accident than the two-man car.

Stone & Webster also report that on the roads in question the cost per accident with one-man cars has decreased 25.5 per cent within the last three years, whereas the cost per accident with the two-man car has increased 13.5 per cent in the same period.

# Union Recognition Sought Through Court Action

### Hearings Being Held This Week in Detroit on Plea of Detroit Union for a Mandamus to Compel Municipal Railway to Arbitrate Wages and Working Conditions

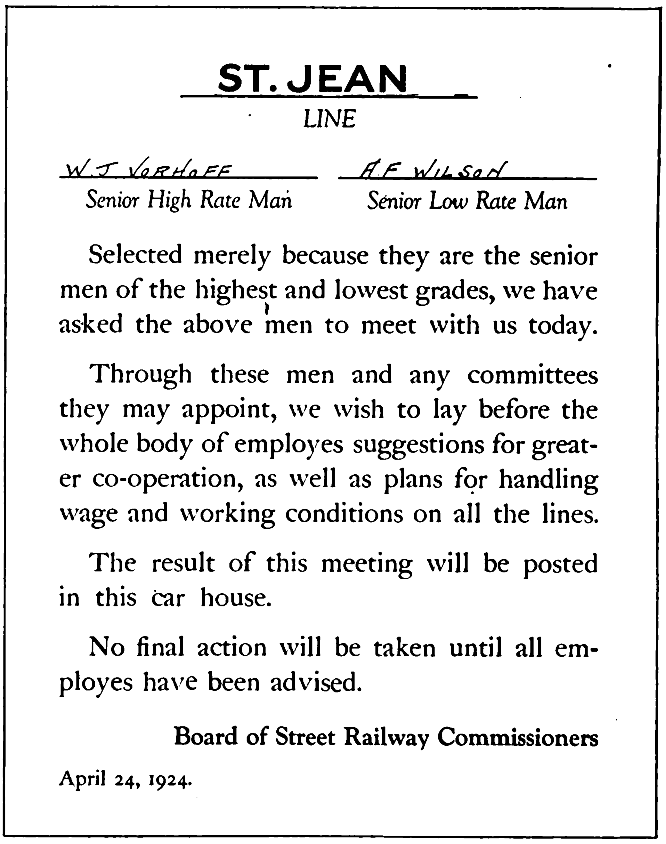
THE hope of the International local in Detroit for recognition by the Street Railway Commission hinges on the result of the hearings this week before Judge T. A. Richter in the Circuit Court. The case of the men, which has been mentioned in the news columns of this paper, was presented to the court at a hearing on the afternoon of May 20. The petitioners based their claim for a mandamus on a clause in the charter of the street railway department requiring arbitration in labor disputes, but to this the commission has replied that the clause does not declare that the commission should arbitrate with the existing union.

The commission's position, as so far made public, seems to be that it is anxious to have a definite understanding in regard to wages and working conditions with its employees, but that it ought not to be compelled to negotiate with a union that it has never recognized. The management feels it is in charge of a trust; that it has no authority or right to permit non-employees (possibly non-residents of Detroit) to dictate the city policies of Detroit, either directly or indirectly, and that its duties, as directors of a self-supporting city department, are to return to the public in improved facilities or decreased fares whatever it can after paying fair wages to the employees. In other words, the men must not profiteer at the expense of the citizens of Detroit. It also feels that if the men understand the situation, they will be fair in what they want in wages and working conditions and will not press their demand for a 14 per cent increase at the present time.

When the D.S.R. took over the property from the D.U.R. in May, 1922, there was a local of the Amalgamated Association on the road. After taking the property over, the Street Railway Commission voted to continue the same wages and working conditions as existed in May, 1922. This fact is put forth as a claim of recognition by the union, but the commission declares that what the union claims as a resolution was merely a recital before the board of wages and working conditions, that this recital was never incorporated in the minutes of the meeting and that if all the union claimed for it were true, it was for a year only and was never renewed. Last summer an arbitration board granted to the men an increase averaging about 10 per cent.

## CO-OPERATIVE COMMITTEE OF MEN SOUGHT

While these negotiations and court proceedings are being held, the D.S.R. management has been endeavoring to establish an organization within the system with which it can discuss wages, operating conditions and other pertinent subjects. It wants a body to which and through which it can submit to the men statements of earnings of the property and statements on labor conditions, such as the fact that during April of this year the department received more than 2,000 applications for employment. From such a body also the department could obtain much valuable help in revising schedules and otherwise improving the service.



**ST. JEAN**

*LINE*

W. J. VORHOFF — *Senior High Rate Man*

A. F. WILSON — *Senior Low Rate Man*

Selected merely because they are the senior men of the highest and lowest grades, we have asked the above men to meet with us today.

Through these men and any committees they may appoint, we wish to lay before the whole body of employes suggestions for greater co-operation, as well as plans for handling wage and working conditions on all the lines.

The result of this meeting will be posted in this car house.

No final action will be taken until all employes have been advised.

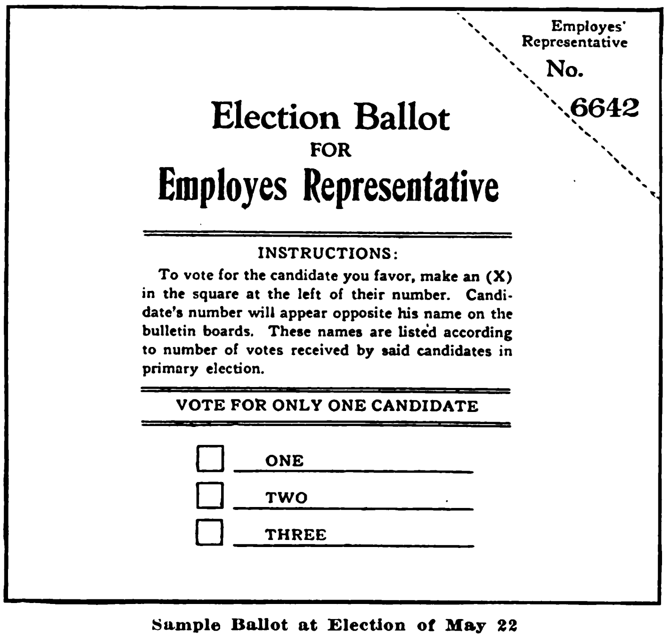
Board of Street Railway Commissioners

April 24, 1924.

Notice of Appointment of Representatives of Election Board

As a first step in the obtaining of this committee the department organized an election board among the platform men. This was done by appointing the senior high rate man and the senior low rate man in each division, as shown in the bulletin reproduced. It was under the direction of these men that the primary election of May 13 took place.

Prior to the time of the primary election it was announced that any platform man who desired to be a candidate for the committee could get his name on the ticket by speaking to his division superintendent and getting five indorsers. The names and the numbers were posted in the carhouse and the men voted by number. The three highest on each line got their names on



Employes' Representative No. 6642

**Election Ballot**
FOR
**Employes Representative**

INSTRUCTIONS:

To vote for the candidate you favor, make an (X) in the square at the left of their number. Candidate's number will appear opposite his name on the bulletin boards. These names are listed according to number of votes received by said candidates in primary election.

VOTE FOR ONLY ONE CANDIDATE

☐ ONE
☐ TWO
☐ THREE

Sample Ballot at Election of May 22

the ballot for the regular election on May 22. A typical ballot used in the May 22 election is reproduced. Up to the present, the plan for a representative committee has been confined to trainmen.

At the primary on May 13, seventy-eight nominees were named in a vote at which about 32 per cent of the trainmen voted, and the result was accepted by the D.S.R. Among the nominees was Herbert Meeker, president of Division 26 of the street car men's union, and two other members of the union board. The rank and file of the men were asked by the union heads to ignore the election, and since the primary nearly half of the election board and approximately 25 per cent of the candidates named are said to have sent in their resignations to the board as board members and candidates. The reason given for the resignations was that in the opinion of these men the primary election showed that those elected would not be representative of the majority.

### OFFER OF LIFE INSURANCE

Coincident with the statement that the department wanted a co-operative committee of its employees, it announced a life, accident and sickness insurance for all employees of six months or more of service. Briefly, the amount of the life policy is $2,000, payable in event of death or permanent total disability of the holder before the age of sixty. The accident and sickness insurance carries a weekly indemnity for $15 for total disability, resulting from accident occurring away from work or from any sickness. No payment is made for the first seven days or for more than twenty-six consecutive weeks. This insurance is without cost to the men from April 26 to May 26, but after May 26 it will apply only to those employees who make written application for its extension and authorize a deduction of $1.25 semi-monthly for it from their pay, and then only if at least 75 per cent of all of the employees who have completed six months or more of service apply for the insurance.

### MAYOR BACKS COMMISSION

The present Mayor of Detroit is F. E. Doremus, who was elected in April, 1923, but he has been prevented by illness from performing the duties of Mayor almost from the time when he was elected. Acting Mayor Joseph A. Martin has upheld the street railway commission in its stand from the beginning and has notified the men that in event of a strike police would be put on every car.

As a future policy, civil service has been suggested by William B. Mayo, general manager of the street railway department, in behalf of the commission, as one way of determining the status of the car men as city employees and possibly eliminating further controversy with the union over wages and working conditions. Other city officials have expressed strong approval of the proposal. It was pointed out that while undoubtedly it would work a hardship on many men on the system who virtually had grown up operating Detroit cars and who because of lack of schooling might be unable to pass civil service examinations and would be forced out of their jobs, it possibly would be beneficial to others, as under civil service hours of labor are restricted, and this regulation might eliminate one of the principal complaints of the men.

# Association News & Discussions

## Secretary Hoover Warns Against Bureaucracy*

### Says No Greater Disaster Could Come to Workers of Electrical Industry than to Place Their Fate in Hands of Political Jobbery

"FEDERAL regulation is not the road to solution of these problems of interstate movement of power. I would regard any federal regulation such as has been found necessary in transportation as a disaster to the development of our power resources. The fact is slowly emerging that the United States will eventually divide itself into several power districts each with its own problems—problems relating to the origin of power, problems of climate, problems relating to the character of industries and uses. No national regulation can supply that intimate knowledge of local problems which this industry requires. I believe that power development and distribution would find its greatest solution in co-ordinated state regulation among groups of states, perhaps with voluntary assistance from the federal government in securing this co-ordination. We need interconnection between state utility commissions where conflicting questions arise. . . .

"We have some persons who insist that the federal government should now undertake wide superpower development. Not being a socialist, I am not for it. Much of this discussion comes from lack of understanding of the practical aspect of the industry. We find many people enthralled with the notions of 'superpower' or 'giant power' who conceive it a superimposed financial and industrial structure over all existing systems. At once they envisage a gigantic and grinding trust in the background. As a matter of fact no superstructure of this sort is possible. Superpower means interconnection of systems and larger central stations, coal or water, scattered over the whole Union. It is in daily progress before our very eyes.

"Interconnection does not imply capital consolidation or the building up of great trusts. It implies the sale and resale of power from one utility distribution system to another, and it implies co-operative action between utilities in the erection of central stations. It must embrace municipal plants as well as corporation plants. It implies no gigantic exploitation, for that is impossible under state regulation of rates and profits.

### EFFECT OF BUREAUCRACY ON INITIATIVE

"But there are objections of more fundamental importance than this. As one who believes that the progress of our nation can come only by preserving on one hand the vital initiative and enterprise of our people and on the other an equality of opportunity to all, I necessarily do not favor the strangulation of both by the hand of bureaucracy and politics. No bureaucracy with a board of directors of 580 Congressmen and Senators would have made the electrical discoveries of the last fifty years or pioneered their application. Our political system has not yet developed, and will not for generations to come, to a point where it will have either the capacity to choose skill or the assured probity to operate these implements. Our institutions will break down if we impose such burdens.

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*Extracts from the outstanding address of the Secretary of Commerce made over the telephone from Washington to the Atlantic City Convention of the National Electric Light Association on May 21, 1924, on the subject, "Superpower and Interconnection."

"We have seen nothing in our history to warrant us in the risk of stopping all progress by the deadening hand of the government. I know of no greater disaster that could come to the workers in this industry than to place their fate in the hands of political jobbery or stifle their individual opportunities through the leveling of bureaucracy which all this would bring about. At the same time the regulation of natural monopolies by the government is a vital part of the preservation of this fundamental equality of opportunity to our citizens, for if the use of this great weapon of power were to fall unrestrained into the hands of dominant groups, then equality of opportunity would also disappear. If we have not the capacity to regulate these great tools in public interest, we much less possess the capacity to operate them on behalf of the federal government."

# High Points from N.E.L.A. Convention of Interest to Railway Men

THE National Electric Light Association held its 47th annual convention at Atlantic City on May 19 to 23, with a record attendance and with the general comment of delegates that it was distinctly the greatest convention of the association. The gist of the entire proceedings is published in the issue of ELECTRICAL WORLD for May 24. A few high points of particular interest to railway men are briefly noted here.

Charles A. Coffin, for many years head of the General Electric Company, in a talk before the association, strongly recommended that the principles and practice of direct employee-employer counsel-table methods be wholeheartedly engaged in as the best basis for maintaining satisfactory industrial relations.

Secretary Hoover's address, made by telephone from Washington, was clearly the outstanding contribution to the meeting. A portion of this, which deals with the subject of private versus governmental ownership, is presented in this issue under a separate heading.

The public policy committee of the association, among several other questions, discussed the agitation in some states for the abolition of public service commissions as a result of appeals to the courts by public utility companies against the rulings of the commission. The committee made this comment: "While we should certainly not recede from our right of appeal, still, wherever possible, it would seem good public as well as business policy to do everything within our power to settle our differences with the commissions and to appeal to the courts only as an extreme resort."

James T. Williams of the Boston *Transcript* made an address in which he said that the press and public utilities are engaged in a common endeavor of serving the public. Aside from advertising, however, public utilities have another relation with the press. They are themselves the sources of news of interest to the public—information having a real news value. Making this information available ought to be regarded as a normal function to be exercised with the same intelligence and with the same will to be fair to all concerned as in the case of advertising, but not by the same agents that place advertising. The two functions are different; their purposes are different; they call for skill of a different sort. To attempt to combine them is to put the press on its guard and to confuse the public. They ought to be as separate as in the conduct of the news, editorial and advertising departments of a well ordered newspaper.

H. G. Taylor, president National Association of Railway and Utilities Commissioners, in an address in which he found much praise for the enterprise and business conduct of the electric utilities, had this to say about the campaign for customer ownership of securities: "To my mind, the fine benefit from customer ownership will not come from the opening up of a hitherto untouched mine of capital, nor is the plan likely to be an alibi for ignorant and incompetent operation, nor will it make arrogance in management any more popular than it has been in the past. Customer ownership, if sincerely and honestly fostered, will revolutionize the industry through the introduction of higher moral values in the relations between the utility and its customers. If conducted on sound principles, it will have all the mutual advantages that flow from a satisfactory and successful partnership in an essential enterprise.

"But woe be to the utility that ever violates the obligations which it thus assumes! All of the results from the time and money expended in cultivating satisfactory public relations can be sacrificed over night through the failure of one or two large electric corporations by unwise and extravagant financing."

The rate research committee noted that during the year three important decisions were rendered on valuation, namely, the Southwestern Bell Telephone case, the Blue Field Water Works & Improvement case, and the Georgia Railway & Power case. In the opinion of the committee, these decisions boil down into the fact that the reproduction value of a public utility property, or at least what it would cost to replace it with property to give equal service as of the date of the proceedings, must be considered in fixing the value of property as a preliminary to the fixing of just and reasonable rates. That is all that needs to be decided. The committee urged that in rate cases particularly the word "depreciation" should be used with a great deal of hesitation, and in its place the phrase "renewals and replacements" should be substituted.

Speaking of the trend of court decisions and legislation, Carl D. Jackson, special counsel for the N.E.L.A., said that the outstanding fact is that courts and commissions continue in their decisions to repeat and reaffirm the principles of common law established centuries ago and of American law developed in the early days of this republic. Recent decisions have, in line with these long-established principles, continued to hold their value, and that thought is the true basis of determining a rate basis upon which earnings should in justice and in the interest of the continued stability of the utility industry be based. To do otherwise, they have held, would be in contravention of the Fifth and Fourteenth Amendments to the Constitution. "Going value" as a distinct element is still generally supported, being recognized by practically all the federal courts and by 22 state commissions. Only two commissions have either criticised it or failed to give it consideration in fixing values.

In the report of the insurance committee, it was brought out that turbine insurance, electrical breakdown insurance and engine breakdown insurance were considered during the year, and that a decision was reached that the lightning and electrical apparatus clause of the fire insurance policies was most valuable in this connection, and that it was very doubtful that there would be damages from electrical breakdowns which would require special protection other than the protection provided by this clause. The report also stated that most of the companies are self-insurers for both workmen's compensation and public liability, and results show this to be good practice and that there is no demand for reduction in rates charged.

Among the officers elected at this convention are the following railway men:

Franklin T. Griffith, president Portland Railway, Light & Power Co., Portland, Ore., was elected president. P. S. Arkwright, president Georgia Railway & Power Co., Atlanta, was elected fourth vice-president. H. C. Abell, Electric Bond & Share Co.; Gerard Swope, General Electric Co.; E. M. Herr, Westinghouse Electric & Mfg. Co., and Harry Reid, Interstate Public Service Co., are members of the executive committee.

The committee on co-operation with educational institutions reported that it now has in production an authoritative text book on public utility problems. which is the joint effort of an eminent professor of economics and one of the leading executives in the central station industry. The book will be available within a year. The committee recommended the establishment of a graduate department for the study of public utility problems at the School of Business Administration of Harvard University. The plan has received the indorsement of the public relations section of the association and the executive committee, and waits now upon the raising of a fund of $30,000 a year for three years for the maintenance of the course, which will be under Prof. Theodore Howard Dillon.

The basis on which this course will be carried on was outlined by Assistant

Dean Donald K. David, who explained that it would be conducted entirely as a graduate school. No claim is made to develop executives, but with the two years of instruction which will be given, the opinion was expressed that men will be provided who can start at the bottom of the industry with basic principles and sufficient orientation, so that they will be better prepared to develop into executives than if they had not attended the courses. The case method of instruction, which has been employed in law schools, will be used to develop straight thinking in arriving at decisions. The social, legal and economic aspects of business administration will be considered chiefly during the first year, and management, rates, service and customer relations during the second year. In preparing the case book, it is expected to spend $175,000.

### Customers Furnished 33 per Cent of Capital Last Year

M. R. Bump, chairman of the customer ownership committee, reported that out of a total of $750,000,000 which has been raised for financing the construction programs of the central station industry, approximately $250,000,000, or 33 per cent, has been raised this past year through the sale of securities to customers. The committee presented an elaborate detailed report of the customer ownership activities of 185 central station companies. The cost of selling securities to customers still engages the attention of the industry, but the results in the last two years have shown that it is possible gradually to reduce the cost of selling to levels that are entirely conservative and satisfactory.

## C.E.R.A. Committees Announced

THE committee appointments of the Central Electric Railway Association for the year 1924 are announced with the issue of the Association's "Brown Book." The personnel of the committees is as follows:

*Auditing:* Tudor W. Jones, chairman, auditor Union Traction Company of Indiana, Anderson, Ind.; Ira E. Guthrie and L. T. Hixson.

*Constitution and By-Laws:* Charles L. Henry, chairman, president Indianapolis & Cincinnati Traction Company, Indianapolis; C. N. Wilcoxon, F. D. Carpenter, W. S. Rodger and Samuel Riddle.

*Finance:* R. I. Todd, chairman, president Indianapolis Street Railway, Indianapolis, Ind.; S. W. Greenland and H. A. Nicholl.

*Hotel and Arrangements:* S. D. Hutchins, chairman, Westinghouse Traction Brake Company, Columbus, Ohio; Harry L. Brown, John Benham, James H. Drew, J. A. Donahey, C. Dorticos and L. P. Morris.

*Safety:* Charles B. Scott, chairman, manager Bureau of Safety, Interstate Public Service Company, 72 West Adams Street, Chicago; Neil Funk, J. H. Alexander, L. C. Bewsey, G. S. Wills, J. B. Stewart, E. M. Walker and James Harmon.

*Program:* M. Ackerman, chairman, general manager Cincinnati & Dayton Traction Company, Dayton, Ohio; I. W. Hansen, J. C. Schade, W. S. Rodger and C. T. Dehore.

*Policy Committee:* C. L. Henry, chairman, president Indianapolis & Cincinnati Traction Company, Indianapolis, Ind.; A. W. Brady, James P. Barnes, E. J. Burdick, J. W. Collins, F. W. Coen and A. C. Blinn.

*Publicity:* E. F. Wickwire, chairman, Ohio Brass Company, Mansfield, Ohio; Harry L. Brown, H. J. Kenfield, J. A. Greenland, H. A. Nicholl, Robert G. Tucker and H. R. Biery.

*Resolutions:* Joseph A. McGowan, chairman, secretary Indianapolis Street Railway, Indianapolis; R. A. Crume, J. F. Starkey, Walter Shroyer and Gus Muhlhausen.

*Rules Covering Interchange of Equipment:* G. K. Jeffries, chairman, general superintendent Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis; C. S. Keiver, L. M. Brown, E. B. Gunn, P. L. Radcliffe and C. C. Fast.

*Transportation:* L. M. Brown, chairman, superintendent Interstate Public Service Company, Indianapolis; G. K. Jeffries, J. A. Greenland, C. S. Keever, F. W. Brown, R. N. Graham and H. R. Biery.

*Supply Men:* Myles B. Lambert, chairman, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.; W. D. Hamer, H. H. Buckman, E. H. Farr, C. L. Van Auken, G. A. Wright, E. S. Gunn, W. McK. White, C. W. Ketteman, L. E. Gould and A. C. Olberding.

*Uniform Charges for Repairs to Interchanged Equipment:* A. Schlesinger, chairman, superintendent of distribution Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis; T. H. Nicholl, E. B. Gunn, J. W. Osborn, H. Savage, P. V. C. See and G. H. Kelsay.

*Membership:* S. W. Greenland, chairman, general manager Indiana Service Corporation, Fort Wayne, Ind.; F. D. Carpenter, C. J. Laney, Myles B. Lambert and J. F. Collins.

*Annual Transportation:* L. M. Brown, chairman, superintendent Interstate Public Service Company, Indianapolis; G. K. Jeffries, J. A. Greenland, C. S. Keever, F. W. Brown, R. N. Graham and H. R. Biery.

# Track Removal Will Not Relieve Congestion*

### Engineers at A.S.C.E. Meeting Discuss Traffic Relief Measures—The Usual Proposal to Remove Car Tracks Was Answered by Several Who Had More than a Superficial Idea of the Subject

CONVINCING arguments to show that the removal of railway tracks from congested streets is not the way to solve the traffic problem were made by a number of prominent engineers at a recent meeting of the City Planning Division of the American Society of Civil Engineers.

In a paper presented by Arthur S. Tuttle, chief engineer Board of Estimate and Apportionment, New York City, it was stated that the economic advantages of the surface car over the bus and taxicab, in capacity used, have been to a considerable extent lost in the crowded sections of the city by reason of the slowing down of speed. Harvey W. Corbett, architect, New York City, advocated the separation of rail, wheel and foot traffic, with the rail traffic being placed underground. Other engineers who had studied traffic problems in St. Louis, Mo., Pittsburgh, Pa., and Providence, R. I., differed with these ideas and argued strongly to show that the surface car lines must be retained as the most efficient users of the street.

Assuming that a city might find itself fortunate enough to accomplish and finance such a separation of street traffic, Harland Bartholomew, engineer City Plan Commission, St. Louis, Mo., asked what problem would have been solved. More traffic would be accommodated, but it would be just a question of time before one, if not all, of the several street levels would be congested What could then be done? More levels to accommodate more traffic? What would be the end? A different solution of the problem must be found. No city has sufficient streets in its business district to accommodate all its traffic. The volume of use is increasing, making the percentage of traffic that can be accommodated in the streets of business districts continually less. Even though a saturation point of motor car ownership might be assumed, it would be financially impossible to provide for unlimited accommodations of all kinds of traffic.

The first step toward a solution of this problem is the reduction or elimination of unnecessary traffic movements. Studies recently made in several cities, Mr. Bartholomew said, had shown that from 20 per cent to 40 per cent of the vehicular movement was commercial in character. The remainder consisted of individual pleasure cars, a small proportion of which conceivably might be engaged in strictly commercial use. Certainly a large percentage of present street traffic bears little relation to the business development of the community. Such traffic should either be eliminated entirely from the congested areas or at least confined to a limited number of streets.

The second step toward a solution of this problem is to correct existing street widths and arrange them so as to permit the greatest possible freedom and circulation of traffic movement without inviting prohibitive expense. The third and last step will be the decentralization of congested areas either by enlarging the areas of the central nuclei or the establishment of outlying sub-centers or both.

George S. Davidson, member of a committee to study the problem of street congestion in Pittsburgh, Pa., said that it would appear at present that Pittsburgh cannot afford to have rapid transit subways. The best it can do would be to build subway loops for trolley cars in the congested part of the city. Building such loops would relieve the congestion of traffic in a small area known as "the golden triangle," but even then only by a few hundred street cars every 24 hours. This would not materially reduce the congestion, which arises through the use of streets by thousands of pleasure automobiles and commercial trucks.

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*Abstract of a paper and discussions published in the proceedings of the American Society of Civil Engineers for May, 1924.

### PRIVATE AUTOMOBILES WASTEFUL OF SPACE

Not the least of the difficulties arises from the parking of cars in double lines along narrow streets, thus retarding the flow of traffic on such sections of the roadway as are not occupied by these standing vehicles. The large department stores are located within this area and the lady of the house adds her share of confusion by causing her car which may represent only herself or at most a family of three or four to occupy 100 sq.ft. of space for an hour at a time. Meanwhile the street car carrying 40 or 50 people is occupying a moving area of not exceeding 400 sq.ft.

There is an economic question involved in this whole matter, according to Mr. Davidson. The large sums of money which it may be necessary to expend for underground loops for street cars must have their interest payments carried for many years and eventually be amortized. Who shall be burdened with these payments? Surely not the street car rider because he is now complaining, and with some reason, that he is paying too much at present. It is not his vehicle that is the primary cause of the congestion. If not he, then, it must be the taxpayer. Arriving at this conclusion it must be considered that comparatively few of the taxpaying class are involved in the reduction of congestion. These few are the automobile owners. It would seem that there are two general plans on which to work. One would be to formulate better regulations for controlling the automobile and truck traffic, in order that the occupation of the streets might be greatly reduced, and the other to plan street improvements for by-passing purposes, the automobile and truck owners carrying the cost.

### CARS CARRY BULK OF TRAFFIC

The trolley car is used to move about 80 per cent of the population that does business in the congested areas, according to George T. Seabury, member of a committee to study the traffic problem in Providence, R. I. The remaining 20 per cent is moved by automobile. It appears that one trolley renders service to approximately 40 people, where one automobile serves only about two people. In other words, a trolley is equivalent in average use of carrying capacity to 20 automobiles. The space needed by a moving trolley is something like 100 lineal feet, whereas the space on the same street needed for a moving automobile is from 20 to 25 ft. Therefore, the use of street space for transportation of people by trolley is more efficient than that by automobile in a ratio of at least four to one. It is admitted that subways for trolleys would be advantageous, but subways are an impracticable solution on account both of the time to build and cost.

It has been shown that as between the trolley and the passenger automobile, the latter must yield. This conclusion is strengthened by the necessity for the use of the pavement by automobiles engaged in other than passenger traffic. It would inflict an almost impossible burden on the transaction of business to exclude commercial vehicles from the use of the streets not only for purposes of transit but for loading and unloading. The elimination of the parked passenger automobile seems the logical immediate solution. It is admitted that the commercial vehicle abuses its logical pre-eminence. Trucks and delivery automobiles all loiter along and too frequently stand unused in front of a business house for long periods. In the main, however, the city is for business and the means of doing business must be given preference.

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## Mr. Budd's Power Company Wins Coffin Medal

THE second annual award of the Charles A. Coffin prize for distinguished accomplishment in the electric light field was awarded to the Public Service Company of Northern Illinois, of which Britton I. Budd is president. Some of the things which were noted as standing out among the company's accomplishments were that in a widely scattered territory with a population of only half a million, it has promoted company development, public relations and customer ownership with particular success. The company showed an increase in net revenue of nearly $600,000 in its fiscal year compared with the previous year. Some 25,000 new customers were added to the lines during the year and the number of customer owners of its securities was increased 35 per cent. They now number 21,409, as against 15,864 at the end of the previous year. Two rate reductions marked developments during the year and in addition transmission lines were extended throughout the territory and generation station equipment installed to meet the growing needs for electrical energy.

The company organized a department of public relations with a vice-president in charge, and every effort is made to have staff men answer complaints by personal call instead of by letter. A policy of aggressive advertising which succeeded notably was followed. Newspaper advertising, painted highway bulletins, colored posters, descriptive folders, motion pictures and the publication of a very attractive yearbook constituted some of the public activities of the company which benefited it greatly.

The same broad policy has been adhered to with employees. They have a saving fund with a total enrollment of 1,769 subscribers, or 85 per cent of those eligible. A safety organization is in operation and an employees' co-operative council represents the employees in their relations with the management. A very attractive vacation resort was purchased for their benefit.

The committee pointed out that the award to this company was a fitting tribute to the practical realization of the possibilities of development in utilities serving many small and scattered communities.

# American Association News

## Hoover Conference on Highway Safety

PRESIDENT Budd of the American Electric Railway Association, at the invitation of Herbert Hoover, Secretary of Commerce, has appointed a committee to represent the association at the joint conference on street and highway safety which has been called by the Secretary. The object of this conference is to study from every viewpoint causes of accidents and ways and means of reducing the number. There will be representatives of life insurance companies, motor vehicle interests, manufacturers and others. The members to represent the electric railway association are as follows: J. P. Barnes, Louisville; C. E. Morgan, Brooklyn, and Charles B. Scott, Chicago. The association was also invited to appoint one of its staff members of the committee on statistics. E. J. Murphy, statistician of the association, will act on this committee.

The first meeting has been called for June 6 at Washington.

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## Wood Preservation

DISCUSSIONS preparatory to the making of final recommendations by the various sub-committees were held at a meeting of the committee on wood preservation in New York on May 26. The circumstances under which the full cell treatment of poles is preferable to the empty cell treatment were outlined. It was decided to recommend the specification of a given amount of oil to be used in treatment rather than a definite depth of penetration. Along with this it will be recommended that railways have inspectors on hand during the application of the pressure treatment.

Plans for the installation of open-tank pole treating plants suitable for medium sized or smaller companies were considered. It was decided to embody two sets of plans in the final report of the committee. Methods of treating poles in place were also discussed.

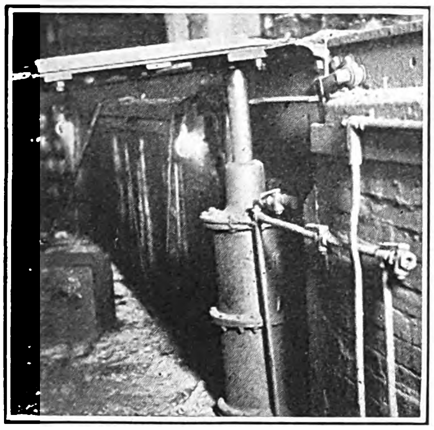
The committee decided to make no report on the subject of conductivity of treated poles. In an appendix it is planned to give information concerning the use of blight-killed chestnut for poles.

Those present were A. P. Way, chairman; M. B. Rosevear, sponsor; M. J. Curtin, W. L. Harwood, J. L. Fritsch, W. H. Fulweiler, E. F. Hartman and E. L. Morier.

# Maintenance of Equipment

## Device for Removing Air Compressors

A HANDY device has been worked out in the shops of the Pittsburgh Railways for expediting the removal of car air compressors. A narrow platform which can be raised and lowered is mounted in a shop pit. This small elevator receives the compressor from the car after the bolts have been removed and lowers it to a position where it may be slid sideways onto a cart.

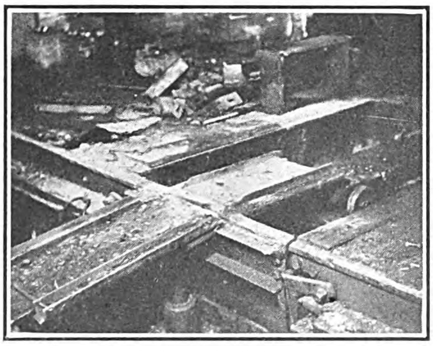


Two 10-In. x 12-In. Brake Cylinders Form the Cylinder in Which the Piston of the Platform Elevating Device Operates

The platform is mounted on one end of a piston rod which travels in two 10-in. x 12-in. brake cylinders bolted together in order to give sufficient travel to the platform. Air is used to move the platform and is admitted to either side of the piston through straight control valves.

The cylinder is installed in a recess in the wall of the pit, while the platform includes a short section of rail and extends over a small adjacent pit as well as the main pit. The platform is locked in the raised position when not in use, the section of rail forming a part of the pit track.

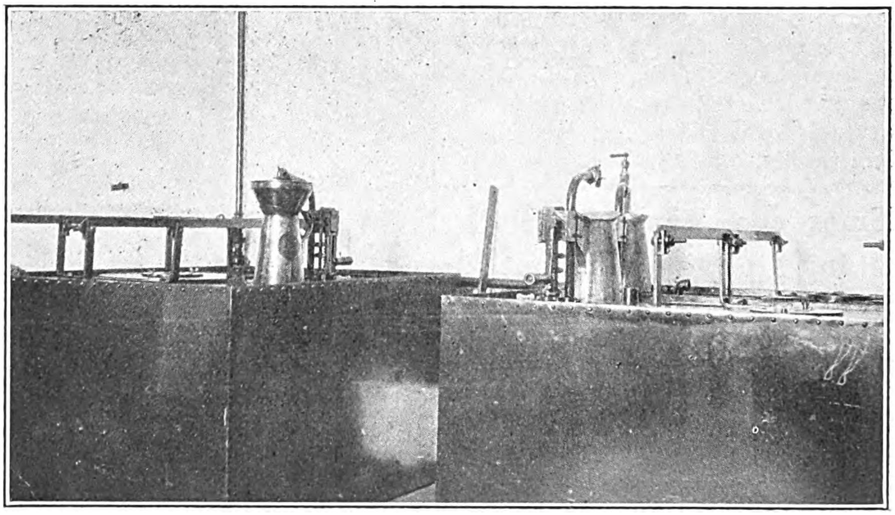
In operation, the car is run over the pit so that the compressor is directly above the platform. A small cart is run onto the platform and the platform raised to take the load off the fastening bolts. After these have been removed the platform is lowered so that the compressor may be moved to the side under the car framework. A ramp connects the shallow pit with the floor and permits the cart to be hauled out of the pit by hand.



Platform Extends Over Inspection Pit and Shallow Pit. A Section of Rail Is Part of the Platform Which Is Locked in Raised Position When Not in Use

## Keeping Walls of Oil House Clean

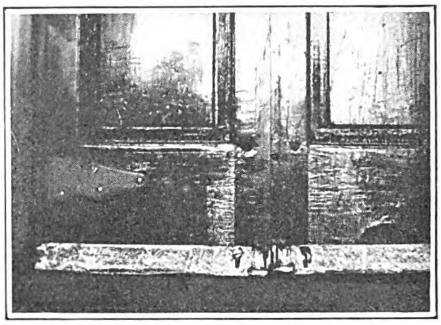
AS A part of its program to impress upon workmen the necessity of keeping lubricating oils clean, the Philadelphia & Western Railway has painted the inside walls of its oil house white. In order to assist in removing finger marks or dirt from the walls and thus keep them in a clean condition, a washable water paint is used. This is a product furnished by the Maxwell Paint Company, Philadelphia, Pa., and is put up in paste form to be reduced with equal portions of cold water.



Washable Walls Assist in Keeping Oil House Clean

## Slotted Bar Stops Drafts Under Door

A SIMPLE device has been designed by W. L. Harwood, engineer power and equipment Worcester Consolidated Street Railway, Worcester, Mass., to prevent drafts under platform doors. This consists of a flat piece of iron with two slotted holes. The bar is fastened to the bottom of the door by two round head screws driven in just far enough to allow it to slide up and down to take care of the irregularities of the platform floor. To give a better bearing for the flat edge and allow the bar to ride over rough places in the floor, such as safety treads, two split rivets were placed over the bars used on the experimental model. The rivet was welded to the bar and the round head was ground off slightly to bear on

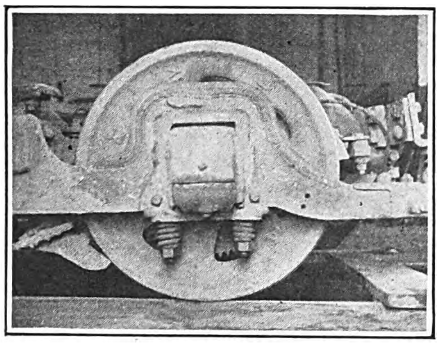


Slotted Bar Closes the Gap Between the Platform Door and the Floor the floor. Later it is planned to make a casting to serve this purpose.

The device works very well and is particularly useful on old cars which are being converted for one-man operation. In the conversion the bulkheads are removed, and because in many cases the platforms have sagged slightly there is an opening under the platform door which would allow cold air to enter.

## Reinforcing Journal Box Pedestals

LEAKS or cracks in truck side frames occur most frequently in the corners of the journal box pedestals. The Long Island Electric Railway, New York, N. Y., has had considerable breakage of side frames at this point, and in order to reduce these breakages it is reinforcing the frames at the top and sides of the pedestal. The accompanying illustration shows the method followed.



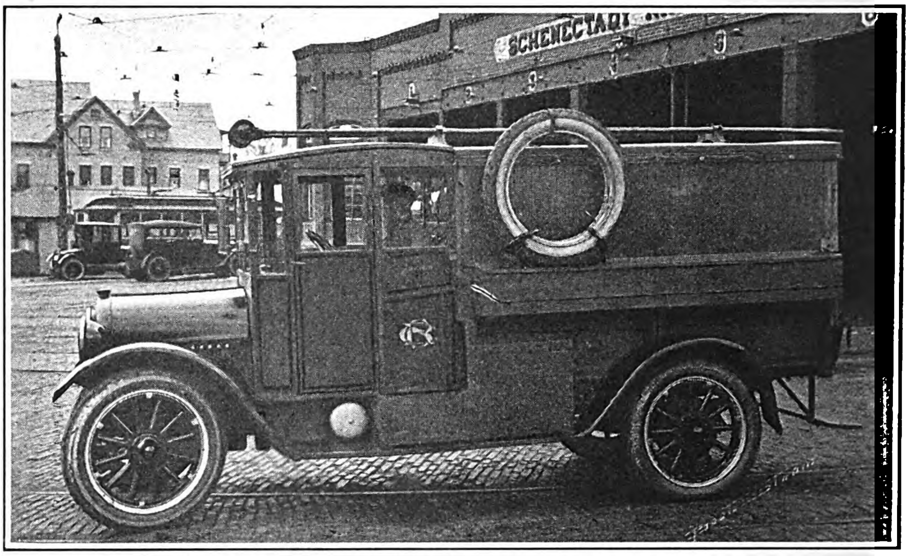
Truck Pedestal Reinforced with Forged Bar to Prevent Breakage

A bar of mild steel is forged to a shape that will fit accurately over the top of the pedestal and extend down along the top of the frame on either side. The edges of the bar and truck frame are scarfed where they join and metal is added by electric welding, so as to weld the bars in place along the edges. Some broken frames repaired in this manner have now been in service for several years and are giving excellent results.

## Emergency Truck for Rolling Stock Department

PRACTICALLY every electric railway of any size whatsoever has at least one motorized emergency wagon for the line department and possibly for the track department. But their use for the rolling stock and shops department is infrequent. The Reo Speed Wagon chassis, shown in the illustration, has been equipped completely by the shop department of the Schenectady Railway Company for emergency attention to failures that occur on cars in service. Two spare trolley poles and wheels are seen fastened on top of the truck. Inside is a full complement of tools, equipment and materials to meet almost any emergency or repair requirements of a car which may become disabled while in service. Jacks of various sizes, crowbars, hammers, wrenches, pliers, saws, spare drawbars, etc., are carried. A stock of fuses, incandescent lamps, all sizes of wire and numerous other small parts are carried in this wagon. It is also equipped with heavy tools such as shovels, crosscut saws, axes, etc., in order to co-operate with the road department.

Niles Persons, master mehanic, is responsible for the use and equipment of this wagon.



Trouble Truck Used by Rolling Stock Department in Schenectady

## Truck Replaces Car for Transporting Armatures

A 5-TON White truck, shown in the accompanying illustration, is being used by the Georgia Railway & Power Company, Atlanta, Ga., for carrying armatures and other heavy parts from the various carhouses to the company's Fulton County plant, where they are repaired. The winch with which this truck is equipped is part of the standard equipment of the White truck, while the crane arm and the body were built by the railway. The truck weighs 12,000 lb. and has a capacity of 10,000 lb., making a total weight of 22,000 lb. Compressors, motors, wheels and axles and other heavy material, which were formerly carried to and from the shops by a work car, are now handled quickly and easily by this truck.

White Truck Used by Georgia Railway & Power Company Unloading Armatures at the Repair Shops

# New Equipment Available

## New Series of Shop Trucks

FIVE new types of industrial trucks are being marketed by the Yale & Towne Manufacturing Company, Stamford, Conn. These are designated as K-20 to K-24, inclusive. Three of the types particularly suited to electric railway use are illustrated. The K-20 model is a high platform truck for moving material and handles miscellaneous units which can be placed on the platform by hand and by chain blocks or hoists. Auxiliary equipment designed for these trucks includes a gravity dump for handling loose material and an electrically operated swinging boom crane for lifting heavy equipment parts.

Large wheels and full spring suspensions give smooth operation over rough surfaces. Steel frames, heat-treated alloy steel axles, with ball bearings, are used in the construction. The controlling mechanism is especially designed to facilitate handling in narrow aisles and congested places. The truck has a rated carrying capacity of 4,000 lb. and can be turned in a radius of 91 ft. The wheelbase is 58 in. and the over-all length is 102¼ in., with over-all width of 38 in.

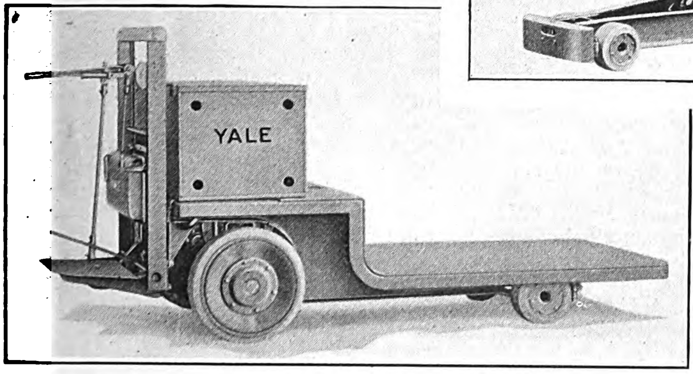
The K-21 model is similar in form to the K-20, but is equipped with a wider platform.

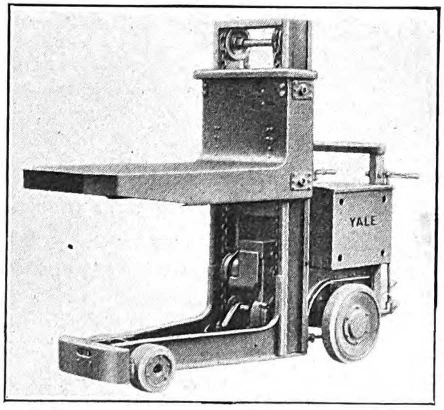
The K-22 model is particularly convenient for electric railway shops. This is a self-loading transportation unit with an elevating platform. It can be used to lift loaded skids from the floor, or can take equipment directly from cars and transport it to places on a bench for overhauling. The truck has a low center of gravity and pressed steel one-piece longitudinal frame members. This truck also has a carrying capacity of 4,000 lb.

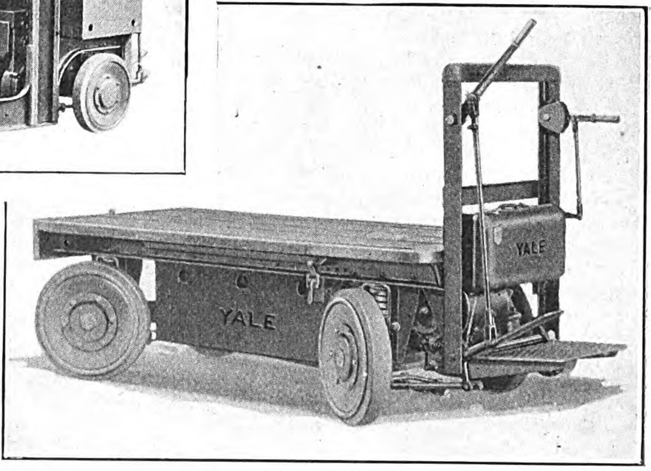
The lifting mechanism is of the triple, spur-geared reduction type. The platform is raised through two Yale steel chains of 2 ton capacity each. Mechanical lowering, speed control and automatic upper and lower limit stops are provided. The wheelbase of this truck is 55 in. and the over-all length 105 in. It can be turned in a radius of 84 in. and will travel at a speed of 6 miles per hour on a level floor, with a load of 4,000 lb.

The model K-23 is a general utility truck, designed with a low platform to reduce lifting. It is built for heavy duty and for operation where the road surface is in good condition. Its over-all length is 110¾ in. with a wheelbase of 55¼ in. It can be turned in a radius of 89 in.

The company has also placed on the market a type known as K-24. This is a three-wheel tractor truck and is particularly efficient as a small load carrying truck and for use in hauling a trailer. The truck has a particularly low center of gravity, which insures safe operation without danger of overturning or tipping sidewise.





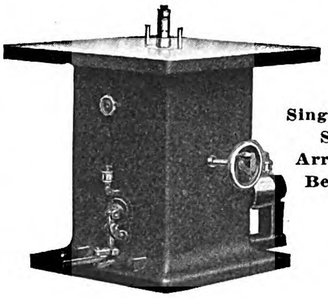


**Three New Trucks Suitable for Electric Railway Shops**
At left, K-23 low platform general utility truck. In center, Model K-22 with elevating platform. At right, the model K-20 high platform general utility truck

## Reversible Wood Shaper

A RECENT addition to the woodworking machinery marketed by the Crescent Machine Company, Leetonia, Ohio, consists of a reversible single spindle wood shaper. The machine is adapted for use on irregular molding operations.

The base is a strong rigid hollow casting, with heavy supporting cross-ribs. The table is also of cast iron, securely bolted to the base. The spindle is mounted on two SKF self-aligning ball bearings. It is given additional support at the lower end by passing through the vertical hollow shaft that carries the cone pulley. This shaft is also mounted on ball bearings that provide for both radial and end thrust. The spindle may be raised 7 in. above the table or dropped entirely below it. By removing the driveshaft and its supporting bracket a motor base may be substituted, on which can be mounted any standard motor running at approximately 800 r.p.m.



**Single Spindle Shaper Arranged for Belt Drive**

The floor space required with motor mounting is 36 in. x 50 in. The table is 36 in. square and the top is 36 in. above the floor. Regular equipment furnished with these shapers includes a pair of 2-in. straight knives, two guide pins, collars to fill the spindle, two throat collars, a wrench and slotted collars.

# The News of the Industry

## One-Man Permits Revoked

### Question of Availability of New Equipment Reopened by Accident at Berkeley

The permit to operate one-man cars in the city of Berkeley, Cal., has been revoked, after the cars had run just thirty days of a six months' probationary period. This drastic action was taken at the demand of improvement clubs following a crash between a one-man car on the Ashby Avenue line and a Southern Pacific electric train at Ashby Avenue and Adeline Street, on the sixth day of the probationary period. No one was hurt in the accident, but passengers were shaken up and one girl claimed that nervous prostration had resulted from the shock.

A series of mass meetings was held after the crash and the demand for the removal of the cars from the streets of the city became so insistent that the Council voted seven to two to rescind the permit. Under the provisions of the revocation the railway may, at a later date, apply for permission to operate one-man cars in Berkeley on other lines where there are fewer grade crossings. It is understood that such an application will be made.

The one-man cars have not entirely ceased to be run in the East Bay cities. At present they are operated on six lines in Oakland, small feeder lines for the most part; on one in Alameda, one line in Emeryville and one in San Lorenzo. No objection has ever been raised to the cars on these routes as they are short-haul lines and do not cross railroad tracks.

The Key System Transit Company has eighty cars of the one-man type, twenty-five of which were purchased in 1920 with the permission of the State Railroad Commission at a cost of $162,500 and fifty-five in the summer of 1923 at a cost of $797,000. The cars purchased in 1920 are of the single-truck type, while the others are of the newer, one-man, two-man type.

It is pointed out by the Key System in a report made to the Mayor and the Berkeley City Council that in nearly four years of operation in the East Bay cities these one-man cars have traveled 3,103,336 miles of more or less congested city streets and have carried 16,354,764 passengers without a single fatality to passengers or pedestrians and "with an entire elimination of the dreaded step accidents, so common on all other types of cars." It is further related that the cars have passed in safely 2,687,590 steam and interurban and street railroad crossings, traveling 10,000 miles of track. The company also asserts that the California State Railroad Commission has repeatedly expressed the official opinion that the operation of one-man cars is safe and economical, and has readily consented to their purchase by the company.

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## Chicago Purchase Negotiations Drawing to Close

The end of the present negotiations between the city and officials of the surface and elevated roads in Chicago looking toward the purchase of the lines by the city has almost been reached. Mayor William E. Dever so admitted recently after the tenth conference called to discuss ways and means for the municipalization of the properties. A statement by Mayor Dever shed no real light on the progress made. He said:

> I expect we will be able to agree or disagree at our next meeting. More than that I will not say.

If the Mayor's comment can be interpreted to mean that a working agreement as to price has been reached, the entire project will be rushed to the voters for their approval. Thus far, the owners of the properties have agreed to accept the Schwartz certificates in payment, and the operation of the lines, it has been agreed, will be in the hands of a joint board.

At the tenth conference John J. Mitchell, chairman of the board of directors of the Illinois Merchants Bank, who has been out of the city, was present. This is the first time he has attended since the conference began.

The other conferees were the same as those who had appeared at previous meetings, with the exception of Samuel Insull, who was represented by former Attorney-General Patrick J. Lucey. The Surface Lines were represented by Henry A. Blair and Leonard A. Busby. Attorneys and officials, of the First Trust & Savings Bank, the First National Bank, the Harris Trust & Savings Company and the banks of the Illinois Merchants group were present.

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## Conferences on Bus Franchise for Buffalo

Herbert G. Tulley, president of the International Railway, Buffalo, N. Y., and Mayor Frank X. Schwab have been holding a series of conferences in reference to a proposed franchise which would authorize the International Bus Corporation, a subsidiary of the traction company, to operate buses in Delaware Avenue from McKinley Square to the Buffalo-Kenmore city line. Mayor Schwab asks the company to consent to a 7-cent fare with free transfers to connecting car lines, but the International asks the right to charge a 10-cent fare with an extra 3-cent charge for transfers to connecting car lines. Enlargement of the Bailey Avenue bus line of the company also is sought by the municipal authorities.

## Fares Up in Baltimore

### Rate to Be Advanced from Seven to Seven and One-Half Cents by Ticket—Eight Cents Cash

An increase in fare from 7 cents to 7½ cents has been granted the United Railways & Electric Company, Baltimore, by the Maryland Public Service Commission, effective June 1, 1924, until April 30, 1925, unless changed by the commission. This new rate is provided when tickets or checks are sold, but in cases of cash fare the rate will be 8 cents for all persons more than twelve years of age. At the same time the commission ordered numerous zone extensions requested by the public and also ordered a valuation of the property. Bus service is to be established between the northern and the southern ends of the city east of Patterson Park. The three members of the commission were not a unit in the decision, the majority consisting of Chairman Ezra B. Whitman and Commissioner Harold E. West. Commissioner J. Frank Harper filed a minority opinion.

The order filed by the majority fixes the rate for children between the ages of four and twelve years at 4 cents. It further requires that transfers be issued without charge to and from the Curtis Bay line. Heretofore, there has been a charge of 3 cents for these transfers. A special rate is ordered for school children. The company is to place on sale school tickets at a rate of 5 cents each, which are to be honored when presented by children more than twelve years old who attend public, parochial and private schools, including the high schools. This sale, however, is to be subject to such reasonable restrictions as the company shall prescribe, subject to the approval of the commission.

The company is ordered to sell tickets or checks at the rate of 7½ cents each on its cars, at its offices and waiting rooms, those sold on the cars being given to the public in quantities of two or more.

Even under favorable prospects for 1924, with a normal increase in riding in Baltimore, it is clear to the Commission that, with the 7-cent fare maintained, the company could make no zone extensions or other service improvements, maintain its property and preserve its credit. The majority report pointed out the great increase in the expenses the railway was under due to the increased cost of labor and materials. It stated that the increase in the cost of the user of transportation in Baltimore had been only 40 per cent, while the operating costs of the railway had increased from $4,102,766 in 1915 to $9,799,312 in 1923. For the same period taxes increased from $904,675 to $1,800,335.

At the hearing before the commission there was considerable agitation for a lower fare, some urging a 5-cent rate. In dealing with this subject the majority report says that even a superficial examination of the figures should convince any reasonable man of the absurdity of this request at this time, or for any marked reduction in the present rate. Such agitation is termed either dishonest or ignorant. Furthermore, the opinion says, a material reduction in the fare rate would raise the question of confiscation.

The maintenance estimate of the company for 1924 is increased by $25,760, due to added labor costs, and the power service shows an increase from $1,312,621 to $1,315,081, also due to extra labor costs. Platform labor has increased in cost from $3,995,475 to $4,075,385 and other transportation expenses are increased from $1,069,610 to $1,089,110. The sum of $567,967 set aside for accidents and damages is the same for 1924 as in 1923. The general and miscellaneous item was increased from $865,286 to $873,786, due to the advance in labor costs.

The opinion states that the total operating expenses will increase $136,276 in labor costs if there is no increase in the car riding. These costs will increase from $9,799,312 in 1923 to $9,935,588 in 1924. The depreciation fund for 1924 is figured as the same as the depreciation in 1923.

In its conclusions the majority opinion of the commission says there was nothing to indicate there would be any increase in the number of revenue passengers in 1924 over 1923; there was no testimony which would lead the commission to believe that the operating expenses would be decreased unless the service was cut to a greater extent than it had already been cut; the Commission was convinced that the company's depreciation allowance should be sufficient to permit it to retire a number of cars each year; the company estimates that its income for 1924 will be $756,687, or $219,579 less than in 1923 if the 7-cent fare is maintained, and in order to increase this income so as to approximate the $1,000,000, which the commission believes is necessary properly to maintain the credit position of the company, it would be necessary to make drastic cuts in the present service; it is agreed that it would be impossible to require the company to make the extensions and other improvements ordered if the 7-cent fare were maintained; on the basis of an 8-cent single fare, or two tokens for 15 cents, the gross income of the company, it is estimated, would be increased by $1,168,212. From this would be taken $588,631 for zone extensions and readjustments and reduced fares for school children and $373,705 for increased labor costs, taxes and fixed charges. This would leave the company but $205,876 of the increased fare. This sum, added to $976,266 net income in 1923 before payment of dividends, would bring the net income for 1924 to $1,182,142. This would make the gross income approximately one and one-third times its fixed charges.

The report concludes that the property of the United Railways should be valued for rate-making purposes, and that when the rate is fixed for 1925 it should be based upon the fair valuation of the company's property used and useful in the public service.

Commissioner Harper in his minority dissenting opinion, said the rate should not be increased unless the right of the company to such increase is shown to be clear and conclusive. He said that the evidence in this case showed that in 1923 the company did earn substantially a balance to surplus, and in his judgment it might reasonably be expected to earn in 1924 a balance approximately equal thereto in amount under the present rate of fare.

The bus lines of the company are not affected by the decision. The fare on the buses will continue at 10 cents.

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## Suburban Line on Long Island Rezoned

Passengers on the lines of the New York & Long Island Traction Company from Mineola to Valley Stream were subjected to an increase in fare on May 25. The company decided that by cutting in two the distance which a passenger may ride for 5 cents, thus, in effect, zoning the line, the increase of revenue will equal that which could be obtained by doubling the fare itself.

The change was brought about by the action of the governing authorities of each municipality through which the line passes. Each granted a temporary amendment of franchise, by suspending the fare requirements, and permitting the adoption of the new schedule. Permission was then obtained by the receiver, Gen. Lincoln C. Andrews, from the Public Service Commission to put the change into effect on one day's notice.

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## Arbitration of Wages in Cleveland Concluded

Arbitration hearings over the demand of Cleveland trainmen for a wage increase and changes in their working conditions were concluded on May 27. In an effort to substantiate their demand for 85 cents an hour for the first three months of service, 87 cents an hour for the next nine months and 90 cents an hour after the first year, instead of the present rates of 55, 57 and 60 cents an hour, the men placed on the witness stand William Polk, president of their local union, and William Rea, the union's financial secretary, in addition to other trainmen.

Mr. Rea testified that it required an income of $2,442.72 properly to support a family of five in Cleveland and that this budget did not include savings of $300 a year, which he felt a man earning approximately $2,500 a year should set aside.

Mr. Polk said he had been a conductor twenty-six years and had a wife and six children whom he has been supporting on an income of approximately $1,400 a year; that he was not able to set aside any savings or indulge in any amusements or books, or see any movies or ball games. Another witness for the men, an extra man, said he was making $1,200 a year, while a motorman in the service fourteen years said his earnings were approximately $2,000 a year, working seven days a week.

Paul E. Wilson, secretary of the Cleveland Railway, testified that an investigation of the home conditions of the company's 2,892 platform employees showed that 536 owned their own homes and also owned automobiles, and that of 1,117 employees who lived in rented houses, 162 owned autos. He also testified that the wages of the car men had gone up 100 per cent in the last ten years, while living costs advanced only 63.4 per cent. He added that the men were asking now for 15 cents an hour more than they got in the so-called "peak price." Mr. Wilson said that the family budget submitted by Mr. Rea was too high and that $1,988 was sufficient instead of the $2,442 testified to by Mr. Rea.

Both John J. Stanley, president of the company, and Mr. Wilson asserted on the witness stand that the financial condition of the Cleveland Railway would not permit any such increase of wages as demanded by the men. Responding to an inquiry as to whether or not it would be possible to reduce the company's maintenance allowance below 12 cents a car-mile, Mr. Stanley said there should be an increase in the maintenance allowance.

Ralph W. Emerson, general manager of the railway, testified that to meet the men's demands the company's expenses would be increased by $4,934,466, divided this way:

$2,466,728 would be the cost of the wage increase.

$1,036,580 would be the cost of granting one day off in eight.

$429,038 would be the cost of increasing layover time at the end of each run from four minutes to ten minutes.

$378,747 would be the cost of paying time-and-a-half for Sundays and holidays.

$361,638 would be the cost of two weeks' vacation asked for by the men.

James W. Holcomb, former city street railway commissioner, is chairman of the board of arbitration, while United States District Attorney A. E. Bernsteen and Max S. Hayes, editor of a Cleveland labor publication, are arbiters representing the union, and Attorney Charles Higley and Thomas P. Schmidt, a director of the railway, represent the company.

The demands of the men were summarized in the issue of the ELECTRIC RAILWAY JOURNAL on April 19, page 632.

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## Seeks Permission for Trackless Trolley in Albany

In the city of Albany a solution may be reached for the improvement of Western Avenue adjacent to which the United Traction Company owns a private right-of-way. The railway has suggested that it be allowed to remove its tracks and substitute trackless trolleys. Any such operation, it is said, would have to be conducted by the recently incorporated holding company as there is some legal question of the right of a street railway corporation to operate trackless trolleys. The Mayor of Albany has named a citizens' committee to confer with the traction officials.

Anticipated bus competition with the traction company in the south end of the city failed to materialize when the parties interested failed to make formal the tentative application they had advanced for permission to operate such service.

## 200,000 Bus-Miles Without an Accident

Operatives of the Kentucky Carriers, Inc., along with the carmen of the Okolona interurban line, of the Louisville & Interurban Railroad, and car men of the Bardstown Road city line, of the Louisville Railway, the two former being subsidiaries of the latter company, heard at a recent dinner that the bus men had operated the equivalent mileage of eight times around the world without an accident. The Interurban carmen had no accidents, and the Bardstown Road car men operated the equivalent of 25,156 miles per accident, as against an average of 5,914 miles per accident for all lines. Each month a dinner is given for the men with the lowest percentage of accidents, based on the number of miles covered during the previous month.

## New Aurora Company Would Operate Buses

The Western Coach Company, Aurora, Ill., of which Attorney B. P. Alshuler, Aurora, is president, has filed an application with the Illinois Commerce Commission for permission to operate buses from Chicago to the Aurora, Elgin and Geneva stations of the Chicago, Aurora & Elgin Railroad. It is the plan of the company to carry both passengers and freight.

The company is capitalized at $100,000. It was recently granted a charter to "own and operate motor coaches, buses and trucks." L. J. Miller, attorney; Ralph C. Putnam and Attorney Alshuler are named as the incorporators. Mr. Miller is secretary of the company.

A petition was filed with the Illinois Commerce Commission some time ago by the Aurora, Elgin & Fox River Electric Company, for which Mr. Alshuler is attorney, for a certificate of convenience and necessity to operate motor buses and trucks between Aurora and Elgin and intervening points for the carrying of passengers and freight. The commission has not acted on this petition.

## Automatic Change-Making Device in New York Subway

As a means of still further lessening delays for the public in subway stations in New York, Frank Hedley, president of the Interborough Rapid Transit Company, and James S. Doyle, assistant to the general manager, have been experimenting for the last two years on an automatic change-making device to increase the speed with which patrons can get change for dimes, quarters or fifty-cent pieces. As a result of their work a device has been perfected which is both a change maker and a bad coin detector.

A demonstration of the operation of one of the machines was made on May 22 at the uptown Seventy-seventh Street station of the Lexington Avenue subway. The operation of the machine in providing the exact change is practically instantaneous. It is expected that within a few days these machines will be in operation for use by the public at the uptown side of the Seventy-seventh Street station of the Lexington Avenue subway line. Further installations at other stations will proceed gradually.

## More Railway Buses Proposed for Use in Houston

The Houston Electric Company, Houston, Tex., recently requested the City Council to grant it permission to operate two additional bus lines in territory that is not served by its present railway system. Both sections are in well developed territory.

Several former jitney operators also petitioned the Council for permits to operate over the same routes, but were refused, due to the recent elimination of all jitneys and the Houston Electric Company's willingness to serve these two sections of the city.

The line to serve the section known as Eastwood has been approved by the Council and the other will no doubt be approved.

The Houston Electric Company expects to purchase ten additional buses to operate on these routes. The new buses will each seat twenty-nine passengers, the same as the ones now in operation.

## Puget Sound Seeks Temporary Restraining Injunction

Upon the failure of the Puget Sound Power & Light Company, Seattle, Wash., to meet the demands of W. W. Shields, county treasurer, for payment of the 1919 taxes on Seattle's Municipal Railway system, the company has been served with notices of distraint of the major portion of the physical properties of the company. In an effort to stay confiscation and sale of its property the company promptly asked the Federal court for a temporary restraining injunction until after a hearing. The suit charges the city and county officials with fraudulent and oppressive action. Mayor Brown states he will suggest in his annual message to the Council that the city acquire by purchase or condemnation transmission lines and other equipment of the company. President Leonard states that the properties are not for sale. The sheriff has levied on $2,000,000 of Seattle property, including executive offices, central stations and substations on which the sale has been ordered June 10.

The city purchased the railway property in March, 1919, and it has been determined in the courts that the power company is liable for the tax for the first quarter of the year 1919, or until the purchase date, and the city for the remaining period of the year.

The situation was brought to a climax when President A. W. Leonard informed the treasurer that the company was determined to pay only its share, or one-fourth of approximately $690,000. Mr. Leonard offered to pay the company's one-fourth share direct to the county, or to the city, which then could pay its taxes in whole.

The county takes the stand that the company is listed on the 1919 tax roll as owner of the railway property, and that, in view of this fact, the company alone is responsible to the county for payment of taxes, that any agreement between the company and the city for payment is foreign to the question. Since the company no longer holds title to the railway property, the county treasurer declares that distraint proceedings can only be instituted against the present property of the company.

The failure of the city to fulfill its contract with the company regarding the shearing of the 1919 tax was the result of an opinion furnished by Corporation Counsel T. J. L. Kennedy, who held that the City Council was without authority to appropriate the necessary funds. Moreover, the corporation counsel asserted, the Council exceeded its authority when, in drawing the terms of purchase of the railway, it agreed to share the 1919 tax. Mr. Kennedy held that neither the general fund nor the street railway revenue fund might be tapped to provide the money, and that a bond issue to meet the demand would not be legal.

Corporation Counsel Kennedy denies the statement made that the city, through failure to pay three-fourths of the tax, has abrogated the entire railway purchase contract.

## Inquiry Into Indiana Wreck Completed

Federal, state and county officials brought their investigation into the fatal traction wreck at Roanoke, Ind., to a close at Fort Wayne on the afternoon of May 27 after questioning about fifty persons, including members of the executive staff of the Indiana Service Corporation, members of the train crews, train dispatchers, maintenance officials and passengers on the ill-fated cars.

While federal and state agents refused on May 27 to indicate the nature of reports which they would submit after a final examination of all evidence taken, coroner J. W. Good, who had charge of the county investigation, intimated that his verdict to be returned in two or three days would include the Indiana Service Corporation as jointly responsible for the crash with members of the train crew of the eastbound flier, the traction company being held responsible merely as a formality and by the fact that the officers of the company were responsible for the actions of their agents.

The joint probe brought out the facts clearly that the crew on the eastbound train failed to take into account the schedule of the fast Wabash Valley Flier, the crack Fort Wayne-Indianapolis Limited train, and left a siding at Mahon, a mile west of Roanoke, without allowing the ordered "five-minute clearance of all regular trains" which is duly prescribed.

President Feustel said on May 27 that this failure probably resulted from the negligence on the part of the east bound crew to observe the time expended in rearranging a trolley pole, after backing from the Mahon siding, eight minutes before the schedule time the limited flier was due to arrive in Roanoke.

## Milwaukee Railway Receives Bus Permit for City Operation

The Milwaukee motor bus war finally ended recently when the new Common Council approved by a vote of twenty-four to one the Milwaukee Electric Railway & Light Company's application to operate buses in the city of Milwaukee. By a vote of fourteen to eleven the Council denied the application for a similar permit sought by the Milwaukee & Suburban Motor Coach line. This action ends a controversy that has existed in the Common Council for more than a year.

The bus fight in Milwaukee is the outgrowth of applications made to the city by competitive bus companies for permission to operate in the city over practically the same routes. Recently the new public utilities committee of the Common Council recommended that the Milwaukee Electric Railway & Light Company should be granted the permit and refused at the same time a similar application of the Milwaukee & Suburban Motor Coach Company. The chairman of the public utilities committee pointed out that he did not believe the Milwaukee & Suburban was so well qualified adequately to serve the public as was the local company.

## Ten-Cent Bus Fare in Rome

The new tariff of the Utica Co-ordinated Bus Lines, Inc., for Rome, N. Y., filed with the Public Service Commission has been approved. The company operates a new bus line in Rome, starting at the corner of Whitesboro and South James Streets, north to East Dominick, thence east on East Dominick Street to First Street, thence over First Street to Mill Street to the passenger station of the New York Central Railroad, returning over the same route. The tariff was filed to become effective on May 24. It provides a one-way fare of 10 cents between any point in the city of Rome served by the bus company or Rome city line of the New York State Railways, to and including the New York Central passenger station; also a one-way fare of 7 cents between Whitesboro and James Streets corner, in the city of Rome, to and including entrance to the plant of the Rome Wire Company. Transfers issued by the New York State Railways (Rome city lines) will be accepted by the bus line at full value of 7 cents. Transfers will be issued by the bus line to the New York State Railways, at points indicated on the transfer, for destinations reached by the Rome City lines.

## Buffalo Company Seeks Higher Fares

Application has been made to the Public Service Commission by the International Railway, Buffalo, for a higher rate of fare in Buffalo so as to finance improvements and extensions to its local car service. The company now charges 7 cents, or four metal tokens for 25 cents, with free transfers. The International has filed with the commission a 500-page brief setting forth its reasons for higher fares. About $150,000 was spent by the company in the preparation of its case. It was reported that if the state utilities board rejects the application of the International the case will be taken into the courts.

That the International must increase its rate of fare for the protection of service is the main argument advanced in the brief. The company contends that improvements in local service will far outweigh the slight increase in fares and car riders will be satisfied to pay a little more for better accommodations. In the brief the company points to the heavy losses sustained during the car strike of 1923, claiming the strike was justified, despite its heavy cost, and it has brought an end to union domination, with the result that economy and efficiency have been encouraged.

The company asks that a fair return be allowed on a reproduction value of $97,000,000 fixed by company engineers. The city authorities have announced that they intend to oppose the increased fare asked by the company.

## 331 Twenty-five-Year Employees at Baltimore Honored

The organization meeting of the Twenty-five-Year Club of the United Railways & Electric Company, Baltimore, Md., was held at the Hotel Emerson, on the evening of April 23. Heads of departments and members of the U. R. A. general committee constituted themselves a reception committee and greeted the 331 twenty-five-year employees as they reached the hotel.

Lively music by the United Railways Band under direction of Bandmaster Belt guided the club members to the banquet hall. There was an attractive menu folder at every plate, which contained the list of speakers and the toasts to which they were to respond, and a list of those who were members of the Twenty-five-Year Club. Here and there, too, was a bit of poetry, or an axiom that was appropriate to the particular place it occupied in the folder.

A reproduction of the badge or button was also printed on the menu, as well as the anniversary slogan—"25th-65th"—indicating the 25th year of the organization of the United Railways and the sixty-fifth year since horse cars started running in Baltimore.

At the head table sat Mayor Jackson, President Emmons, Vice-President T. A. Cross, Vice-President and General Manager L. H. Palmer, Superintendent of Transportation W. C. Ludwig, Assistant to the President H. B. Potter, and the seven fifty-year men employees. The lady members of the club occupied tables immediately at the front and adjacent to the press table.

During the repast President Emmons, accompanied by Vice-President Palmer, went through the entire hall, shaking hands with each person present, and to each of those who had been with the railways twenty-five years or more he presented a beautiful gold button. At this time buttons were not presented to the fifty-year employees, these presentations being made a later feature of the program. To each woman member a bouquet was given by Mr. Emmons. After dinner came the speeches.

Baltimore Veterans Who Participated in Recent Service Celebration

## $300,000 for Improvement of Rochester Amusement Resort

The New York State Railways is building at its amusement park on Irondequoit Bay, Sea Breeze, near Rochester, probably the largest swimming pool in the United States, as well as the only pool of its kind in America using salt water. The pool is being constructed by the Natatorium Company, New York, builders of the Madison Square Garden Pool.

It will have a water surface of 38,000 sq.ft. and its dimensions will be 300 ft. x 175 ft. A modern pavilion and bathing houses also are on the company's building program.

The utility plans to place Sea Breeze Park on a high standard as a lakeside amusement park and the new pool is said to be only the first step in a comprehensive program of improvement that eventually will involve the expenditure of $300,000.

## De Luxe Limited Service Between Detroit and Flint

Two de luxe parlor cars just completed in the company's own shops will be placed in limited service on or about June 1 between Detroit and Flint by the Detroit United Railway. The cars will operate three times daily out of each city and carry only thirty passengers. All chairs will be subject to reservation at a charge of 50 cents in addition to the regular or commuter fare.

The new cars, for the present, will leave Flint at 8:20 a.m., 12:20 p.m., and 4:20 p.m., and will leave Detroit at 8:10 a.m., 12:10 p.m., and 4:10 p.m. daily. Arrangements are being made so that it will be possible to make reservations in advance at the company's waiting rooms. Any seats remaining unsold when the car starts may be secured through the conductor in charge.

If popularity is established through patronage, it is the company's intention to increase the number of such cars on the division and extend similar service to other interurban lines.

## First-Class Motor Tours Arranged by Wisconsin Motor Bus Lines

To give the vacationists an opportunity of "Seeing Wisconsin First," the Wisconsin Motor Bus Lines during the coming summer will conduct tours of two, three, four and seven days' duration, operating principally from Milwaukee. The tours will be made in "parlor car buses" with a minimum of ten passengers required for each trip. The tours are characterized as "The Dells" tour, "Cherry Land" tour, "Big Woods and Wisconsin Valley" and "Around Wisconsin and Mississippi River" tour. These tours will be personally conducted and all expenses incident to each will be included in one fare. All tours will be in charge of carefully selected and trained operators.

Pleasant day trips in the Land o' Lakes are being arranged by the Wisconsin Motor Bus Lines, in connection with the electric lines of the Milwaukee Electric Railway & Light Company and the Milwaukee Northern Railway and with the boat lines on the inland lakes and on Lake Michigan.

The Wisconsin Motor Bus Lines has issued a descriptive pamphlet on its loop trips in the Land o' Lakes, giving some detail on the historic and other notable features of places visited en route.

## Bus Lines in Louisville Rearranged

The Louisville bus service as handled by the Kentucky Carriers, subsidiary of the Louisville Railway, has undergone a number of important changes recently. The company announced that it was discontinuing the Third Street line because after a trial of almost a year this line had shown it could not be operated except at a loss. The other line to the Highlands has been extended several blocks, and whereas eleven coaches were used in operating the two lines, the entire fleet of eleven cars, with one reserve car, making twelve, will now be used on the line to the Highlands. Another important change has been made by routing buses over the busiest sections of the downtown portion of the city. Fourth Street, the most important retail street, is now used.

## Seven-Cent Fare Asked on Niagara Falls Line

The International Railway, Buffalo, N. Y., is seeking an order allowing it to raise the fares on the Niagara Falls local lines from 5 cents to 7 cents with four metal tokens for 25 cents, the same rate as the company charges in the city of Buffalo. Abandonment of the Sugar Street line and the operation of trackless trolleys on several of the local lines in Niagara Falls also is asked by the International. Herbert G. Tulley, president of the International, has informed the City Council at Niagara Falls that the Sugar Street line cannot be made to pay.

The City Council there is opposing the raising of local fares and the abandonment of the Sugar Street line and it asks the International to restore two-man crews to the Main Street line. Since one-man cars have been introduced on many of the Niagara Falls local lines more frequent service has been maintained than formerly.

## Wage Agreement Renewed at Grand Rapids

The agreement of the Grand Rapids Railway, Grand Rapids, Mich., with its employees covering wages and other working conditions expired on May 1. The employees demanded an increase in the wage scale, but after various negotiations, it was finally agreed that the old arrangement should be extended for a period of one year, until May 1, 1925. No change was made in the wage scale or any of the other provisions, the entire agreement being simply extended one year from May 1, 1924.

Thus the following scale is continued in force: First six months, 49 cents an hour; thereafter, 51 cents an hour, with 5 cents an hour added for operators of one-man cars.

## Conference Called on Surface Transportation in Chicago

A conference of all surface transportation concerns operating in the city of Chicago is to be called by the Illinois Commerce Commission at its offices at 139 North Clark Street.

Rerouting of loop cars, together with a consideration of the routes taken by the bus lines, with a view to their co-ordination for the best interests of all transportation, may be the result of the conference. A general rerouting plan of street cars, largely worked out by Major R. F. Kelker of the city engineering staff, in conjunction with traffic men of the Chicago Surface Lines, is now under consideration by the committee on transportation.

The concerns cited to appear at the hearing in addition to the Chicago Surface Lines are the Chicago Motor Coach Company, the Chicago Motor Bus Company and the Depot Motor Bus Company.

## Subway Station Measure Before Massachusetts House

The Massachusetts House has advanced the bill to provide for a subway station in the Cambridge tunnel at Charles and Cambridge Streets, Boston. The measure is on petition of the Massachusetts General Hospital and before being advanced was amended so that the expense shall not exceed $600,000, which is to be met by a bond issue.

A resolution has also been reported by the ways and means committee of the Legislature for an investigation by a joint special committee of methods of financial, additions, extension and improvements of the Boston Elevated Railway system and of the advisability of continuing public operation.

## Applies for Dismissal of Electrification Ordinance in Buffalo

Council for the New York Central Railroad has applied to the City Court of Buffalo for dismissal of the city's complaint in the suit brought under a city ordinance to compel the New York Central and other railroads entering Buffalo to electrify their lines. It is the contention of the railroads that the ordinance is unconstitutional.

The New York Central claims that a recent decision of the United States Supreme Court holds that in matters of this kind, the Interstate Commerce Commission has the only jurisdiction. Railroad officials say it would cost $60,000,000 to electrify their lines in the city and the project could not be carried out for four or five years.

William S. Rann, counsel for the New York Central, will base his position on the decision of Justice Taft in the Los Angeles case. There it was held that the State Railroad Commission of California did not have authority to compel the Southern Pacific and other lines to build a union station in Los Angeles. In this case, the United States Supreme Court rules that this would in all probability require the railroads to issue new securities, which could not be done without sanction by the Interstate Commerce Commission.

## Berlin Official Studying Rapid Transit Methods Here

Emil Pavel, director of the Electric Elevated and Underground Railway, Berlin, Germany, is making a trip through this country to study rapid transit conditions here. After attending the automobile convention at Detroit during the week ended May 24, his itinerary is taking him to Chicago, Boston, Philadelphia and New York.

Since 1903 Mr. Pavel has been director of the Elevated and Underground Railway in Berlin, having particular control over operation. He also is a member of the board of supervisors of the Berlin Omnibus Company.

After he was graduated from the Berlin Technical High School in 1892, Mr. Pavel was connected with the government railways, serving as chief construction engineer in the divisions of Cöln, Essen and Erfurt. He also was for some time government representative at the Krupp works at Essen and at other factories in the Ruhr district. In 1901 he resigned from government service and joined Siemens & Halske in Berlin in charge of their electric railway department. Since Jan. 1, 1903, he has been engaged in his present work.

## Wages Up Two Cents in Chicago

An increase in wages of 2 cents an hour, affecting all trainmen of the Surface Lines and the Elevated Lines in Chicago, will go into effect on June 1, in accordance with the arbitration agreement entered into more than a year ago.

The increase follows one of 3 cents an hour over the old scale, granted to the men after a board of arbitration of three men had decided the issue.

The new scale provides for pay for surface men at the rate of 70 cents an hour for the first three months. For the next nine months the pay is 73 cents an hour, and after one year the wage is 75 cents an hour, 2 cents increase for each division. This agreement continues in effect for another year, but the agreement with the various shop crafts expires in August.

For the Elevated, regular motormen will receive a flat rate of 77 cents and extra motormen will receive 71 cents the first three months, 72 cents the next nine months, 77 cents the second year and thereafter. Regular conductors will receive a flat rate of 72 cents. Extra conductors receive 70 cents the first year and 72 cents the second year and thereafter. Regular guards will receive a flat rate of 70 cents. Extra guards will receive 67 cents the first three months, 68 cents the next nine months and 69 cents the second year and thereafter.

## News Notes

**Will Put on Bus Lines.**—The North Carolina Public Service Company, Greensboro, N. C., has announced the establishment of two bus lines within the next few months. The next step will be some definite legislation by the City Council concerning such operation.

**Wants Tayler Grant Extended.**—The City Council of Cleveland, Ohio, recently voted to ask the Cleveland Railway to extend operations of the Tayler grant to all sections of the city. If this is done, West Park, Nottingham and the section on Euclid Avenue beyond East Cleveland would receive service at the city rate of fare. An effort to have restored the 349 car stops in the city eliminated a short time ago was defeated.

**New Magazine Appears.**—An "original and distinctive" name is wanted for a new paper which made its debut in April and which is being published monthly by the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo. A prize of $25 is offered for the best suggestion. It is the editors' plan to give some interesting information about the company's business and some live stories about the activities of the various departments. Personal notes about the employees are sought so that all may become better acquainted.

**Railway Has Effective Police Department.**—The Kansas City Railways, Kansas City, Mo., has a police department somewhat different from that of other car companies. It consists of a chief day and night, a captain and fourteen officers, the department functioning twenty-four hours a day. A fast automobile equipped with a police siren is used for making hurried calls to places where the officers are needed. The men have full police authority and answer accident calls, handle crowds, secure names of witnesses, assist in caring for injured and clear the streets. They also arrest traffic violators or disturbers when necessary. In times of heavy traffic movement such as parades, baseball games and other special events they report to the chief dispatcher and help to distribute the load, preserving order and exercising general police authority. These men are also used as guards and watchmen at all points where money is handled. In addition to the special police force there are 115 police commissions in the transportation department of the car system.

**Wage Increase Granted.**—A 3-cent an hour wage increase was granted on May 17 to motormen and conductors of the Beaver, Penna-Steubenville, Ohio, division of the Steubenville-East Liverpool & Beaver Valley Traction Company's lines. A one year agreement was signed calling for a scale ranging from 49 to 63 cents an hour. Employees on the East Liverpool division who had sought a flat raise of 10 cents an hour accepted the company's compromise offer after a board of arbitration had been appointed and prepared to open its sessions. The scale also applies to trainmen on the Steubenville division and is retroactive to May 1.

**Wage Hearings Concluded.** — Hearings by the board of Arbitration, which have been held in the Trenton City Hall to adjust differences between the Trenton & Mercer County Traction Corporation and its employees, have been concluded. Lewis C. Parker of Westfield, Mass., chairman of the board, at the conclusion of the examination of witnesses, asked that James H. Vahey, arbitrator selected for the men, and Albert S. Richey, arbitrator for the company, submit briefs.

**Wage Agreement Removed at Erie.** —Trainmen in the employ of the Buffalo & Lake Erie Traction Company at Erie, Pa., have agreed to continue to work at 60 cents an hour, the same scale of wages in effect for the last year. The men had asked an increase of 5 cents an hour, while the company sought to have them accept a decrease of 5 cents an hour.

**Wants Higher Fare.** — The Virginia Railway & Power Company, Richmond, Va., has petitioned the State Corporation Commission for increased rate in Petersburg.

**Opposes Bus Competitors.**—The East St. Louis & Suburban Railway, East St. Louis, Ill., through counsel, has filed complaint with the Illinois Commerce Commission at Sprinfield against the continued operation of the Intercity Express Company of St. Louis, Mo., and the Frederick Truck Company of O'Fallon, Ill. It charges that these companies are operating bus lines in competition with the Suburban's interurban lines without securing permits to do so from the Illinois Commerce Commission.

**Withdraw Demands.**—Employees of the Auburn & Syracuse Electric Railway, Auburn, N. Y., recently agreed to withdraw their demands for higher wages and to renew the contract which expired on May 1. The wage scale which will continue is: City carmen, 45 cents an hour, interurban carmen, 50 cents an hour; express and freight carmen, 52 cents an hour.

**Citizens Will Take Over Line.**—Citizens of Greenfield and Montague, Mass., at special town meetings on May 24, ratified an agreement of the boards of selectment of these towns to take over the railway line between Greenfield and Turners Falls from D. P. Abercrombie, receiver. The purchase price is $62,000 for operation under the Massachusetts transportation area act. Four trustees, two from each town, will be named to manage the line. The first members will be for one-year and two-year terms and all subsequent members for two years each. It is stated by the receiver that as nearly as can be computed this line made an operating profit of $12,000 last year. The line has 8.7 miles trackage.

**Seek Increased Wages.** — Representatives of the motormen and conductors employed on the lines of the Pennsylvania-Ohio Electric Company in New Castle, Youngstown and Sharon, in conference on May 19 with representatives of the company, presented a demand for an increase of 10 per cent in wages.

**Weekly Pass in Jacksonville.**—The Jacksonville Traction Company, Jacksonville, Fla., has received permission as of June 1 from the Railroad Commission to change from a straight cash or token fare of 7 cents to a schedule of 10 cents cash, 7-cent tokens sold five for 35 cents and $1.25 for an unlimited-ride, transferable weekly pass. Both the tokens and the passes will be sold on the cars. The propulation of Jacksonville is approximately 100,000.

**Front Entrance Cars in Use.**—The United Railways, Baltimore, Md., has placed two front-entrance cars on the Roland Park line as an experiment. Instead of the pay-as-you-enter type, which is used in Baltimore, the fares are paid as the passengers pass from the front to the rear. The passengers leave by a center door.

**Improvement Work Abandoned.**—The Worcester Consolidated Street Railway has notified the Mayor of Worcester, Mass., that it is not financially able to undertake relaying the rails on Park Avenue this year. The Mayor is making a drive for better streets and the City Council committee on streets was prepared to recommend that Park Avenue, one of the main thoroughfares, be repaved this year. The project now has been abandoned.

**Strike in Alliance Settled.** — Following a five-day strike on the lines of the Stark Electric Railroad, Alliance, Ohio, the men returned to work adopting the old wage scale and eliminating a section of the working agreement calling for two men on all passenger cars. The men had asked for a 9-cent increase, while the company had proposed a 10-cent reduction. Following the settlement of the strike N. H. Brown, general manager of the company, announced that one-man cars would be placed on city runs as soon as present cars could be remodeled. The present cars are full length, side entrance, pay as you leave. Under the company's plans only the two end doors will be operated by the motorman.

**Asked to Accept Reduction.**—Union carmen employed by the Boston Elevated Railway, Boston, Mass., have been asked by a vote of the board of trustees to accept a reduction of 5 cents an hour, beginning July 1, when the existing contract expires. The action followed recent demands made by the wage conference committee of the local asking for a new maximum of 95 cents an hour for the blue uniform men, who comprise the bulk of the employees.

**No Objection to Bus Line.**—With the exception of a suggestion that the city operate a municipal bus line, there was no objection made at the public hearing before the Rensselaer City Common Council on May 20 on the proposed ordinance granting permission to the Capitol District Transportation Corporation to operate buses in the city in lieu of the present Broadway-Aiken Avenue line of the United Traction Company. The transportation company will be prepared to start operating the buses as soon as the necessary permission is obtained.

**Weekly Pass Continued.**—At the request of the State Department of Public Works, the Tacoma Railway & Power Company, Tacoma, Wash., has consented to continue the $1 weekly pass until June 15. Manager Sullivan expressed the belief that the weekly pass had become so popular with patrons that they do not want the company to discontinue it, and he said further that the company plans to make every effort to continue it, if possible. The weekly pass was installed as an experiment about a year and a half ago. Reports to the State Department of Public Works evidence that while the sale of the pass greatly increased traffic, with about 10,000 passes sold weekly, it was unprofitable to the company. The expiration date had been set for May 25 until the present continuance was announced.

**Trackless Trolley in Seattle?**—Seattle may test out the trackless trolley as a means of furnishing transportation service in the outlying residence districts, it became known recently. Superintendent Clark R. Jackson of the public utilities department has been asked by city Councilmen to make an immediate investigation with a view to establishing the service on some route reaching a populous residence section now without street car facilities. Seattle is said to be particularly adaptable for such a system, as there are thickly settled districts that cannot be given street railway transportation because the Seattle Municipal Railway lacks funds to build the extension.

**Another Company Increases Fares.**—The Beech Grove Traction Company, Indianapolis, Ind., has been granted permission by the Public Service Commission to increase its rates to conform with the recent increase granted the Indianapolis Street Railway. In order to be on a par with the Indianapolis Street Railway in the transportation of city passengers the Beech Grove Traction Company has made arrangements with the former company to sell and interchange tickets. The fares on the lines of the Indianapolis Street Railway call for a 7-cent cash rate and four tickets for 25 cents. The filing of the application was noted in the ELECTRIC RAILWAY JOURNAL for May 24, page 826.

**New York Commission in New Quarters.**—The New York Transit Commission will remove its headquarters on July 1 from 49 Lafayette Street to 270 Madison Avenue. Arrangement has been made for the future occupancy of the entire building at 49 Lafayette Street, which the city owns, by the Department of Transportation, a city body created by the last Legislature. The commission has leased two floors of the building at the northwest corner of Madison Avenue and Thirty-ninth Street, comprising 23,000 sq.ft. of space. The new quarters will accommodate the 350 employees the commission retains and will also afford adequate space both for meeting and hearing purposes. On July 1 Mr. Delaney, who will head the new board, will take over his old offices as head of the forces left in the Lafayette Street building, most of whom served under him during his previous term as Transit Construction Commissioner.

## Foreign News

*From the Journal's Own Correspondents*

### Trackless Cars Succeed Tramway in Wolverhampton

After experience with the trackless trolley on its Wednesfield route, the Wolverhampton, England, Tramways proposes to introduce the same system on its Bushbury route instead of renewing the tramway track there. The conversion of the route and the extension of it for a mile are estimated to cost £9,000, and the cost of the trolley buses will be £10,500 more. The reconstruction of the tramway track, it was estimated, would cost £24,000. Single-deck vehicles seating 38 passengers each are proposed. Tenders for the vehicles and equipment have been invited.

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**Naples Tramway Shows Loss.**—The Belgian company that owns and operates the tramway system of Naples, Italy, announces that the operation during 1923 shows a loss of 1,044,721 Belgian francs.

**Belgian Coast Line Has Increased Revenue.**—The summer resort link of Belgian coast towns is today better furnished with transport facilities than before the war. The electric line running to the westward from Ostende to Blankenberghe had receipts of 6,627,000 francs in 1922, which increased to 7,872,000 francs in 1923.

**Escalators Supersede Lifts.**—Three escalators, which supersede five lifts, were put into service at the Bank of England station of the Central London Railway on May 7. The cost of construction has been about £96,000. Each escalator is driven by a 45-hp. motor. The speed is 90 ft. per minute, and with two passengers on each step each escalator can carry 135 passengers a minute, or more than 24,000 per hour for the three. A unique feature is that the three escalators are abreast in one shaft 27 ft. in diameter. The work of excavation presented extraordinary difficulties owing to the number of underground pipes that had to be dealt with. It was begun in August last and has been carried out without any interference with the railway service. The central escalator is reversible, so that two of them can be worked in the ruling direction of traffic.

**Glasgow Subway Electrification.** — The estimated cost of improving the Glasgow subway railway and the conversion of it from cable to electric traction is £600,000, or about £100,000 per route-mile, according to a report presented to Glasgow Town Council. Another report has been called for as to the practicability of increasing the present gage of 4 ft. to the standard gage of 4 ft. 8½ in.

**Over a Billion Passengers in Paris.**—The number of passengers carried in 1923 by the street car and autobus sections of the Paris, France, "Transports en Commun" is reported by the Prefecture of the Seine as 1,024,719,219. This compares with 917,723,323 passengers in 1922, showing an increase of 11.6 per cent. Receipts in the same period have gone up from 297,000,000 francs to 330,000,000 francs.

# Financial and Corporate

## Jersey Plan Sanctioned

### Commission Approves Readjustment Terms of Public Service Corporation—Valuation Illegal

The Board of Public Utility Commissioners of New Jersey has approved the application of Public Service Railway for the sale of the Public Service Terminal Building in Newark, to Public Service Corporation of New Jersey, the consideration being $7,500,000, the purchasing corporation giving $2,500,000 in cash and assuming $5,000,000 first mortgage bonds outstanding.

At the same time the board approved the application of the railway to change its capital stock from par stock to non-par stock of the full amount, also authorizing the issuance of 500,000 shares non-par value capital stock of Public Service Transportation Company, which is a subsidiary of the Public Service Corporation of New Jersey. The new stock is to be sold at $10 a share, the proceeds being used to pay for buses already acquired and others to be purchased as part of a general scheme for a co-ordinating trolley and bus service, to be operated in the New Jersey communities served.

The board has filed a decision approving the application made by Public Service Gas Company and Public Service Electric Company, subsidiaries of the Public Service Corporation of New Jersey, for merger of the two into a new company to be known as Public Service Electric & Gas Company.

The terms of the plan as originally announced have been supplemented by making provision for a sinking fund for the purchase of the perpetual interest bearing certificates of the corporation and the pledge of a 7 per cent instead of a 6 per cent preferred stock of the Public Service Electric & Gas Company as collateral therefor.

As explained in the ELECTRIC RAILWAY JOURNAL for Dec. 22, 1923, page 1070, the application for permission to sell the terminal set forth that occupants of the terminal, among them the Public Service Gas Company and the Public Service Electric Company, desired additional office space and that the railway deemed it inadvisable, if it had the available funds, which it has not, to make the necessary capital investment for the enlargement. It was further explained that the sale of the terminal by the railway would put the property in the possession of an owner who could advantageously make the enlargement and would in addition put the railway, which presented the petition, in possession of considerable funds to assist it in and about its railway business.

Judge Rellstab on May 17 filed with the clerk of the United States District Court at Trenton, N. J., a memorandum handing down a final decree in the injunction proceedings of the Public Service Railway against the Board of Public Utility Commissioners of New Jersey declaring as confiscatory and illegal the valuations by the board on the railway properties, and that the rate orders based on those valuations are correspondingly illegal.

The decree enjoins the state commission from fixing the railway's passenger rates, pending an experiment now being made on the company's lines of the zoning system of fares.

Judge Rellstab's final decree upholds a previous decision of the Federal District Court, where three judges sat on the case, declaring that the utility board's valuation of the railway's property was palpably below the true values.

As a result of the decree, the present rate of passenger fares will continue in effect.

Under the modified decision of the federal court, as returned by Judge Rellstab last September, the railway was authorized to charge a 5-cent fare within the city limits of larger cities of the State, and a 10-cent fare, without transfers, for rides beyond the limits of the cities. This arrangement was definitely established on May 17 with the filing of Judge Rellstab's final decree.

The injunction proceedings against the utility board were based on the contention of the railway that a fare of 7 cents, with 2 cents for a transfer, ordered by the commission, was confiscatory and should be set aside.

The 5-cent-city-limit fare prevails in all the large cities in which the company now operates.

## San Francisco Municipal Loss $272,046

### For the Year Ended June 30, 1923, an Excess of Income Over Operating Expenses and Reserves is $13,831, But Taxes and Similar Items Amount to $285,876

THE Municipal Railway of San Francisco continued to lose during the year ended June 30, 1923, according to the annual report for that period as prepared for and approved by the finance committee of the Board of Supervisors, and recently made public. Total revenue for the year was $3,005,201, and interest on securities owned increased this by $55,297, making a total income of $3,060,498. Deducting operating expenses of $2,302,055 left a net of $758,443. Against this was charged interest on the funded debt, $205,723, and reserve for depreciation and accidents (18 per cent of gross earnings), $538,889, leaving the balance $13,831.

For the purpose of securing a comparison between the results of operation of the municipally owned utility and those operated by private capital, the charter of the city and county of San Francisco provides that the operating reports shall include certain comparison charges consisting of items which constitute part of the actual cost of operating privately owned com-

COMPARATIVE INCOME ACCOUNT, SAN FRANCISCO MUNICIPAL RAILWAY, DEC. 28, 1912, TO JUNE 30, 1923

| | —Years Ended June 30— | | Dec 28, 1912 to June 30, |
|---|---|---|---|
| | 1922 | 1923 | 1923 |
| Passenger revenue | $2,884,815 | $2,993,829 | $22,242,008 |
| Miscellaneous revenue | 11,300 | 11,372 | 94,004 |
| Total revenue | $2,896,116 | $3,005,201 | $22,336,012 |
| Interest on securities owned | 48,476 | 55,297 | 270,155 |
| Total income | $2,944,591 | $3,060,498 | $22,606,167 |
| Operating expenses: | | | |
| Way and structures | $112,630 | $109,573 | $684,453 |
| Equipment | 216,315 | 216,606 | 1,307,850 |
| Power | 383,140 | 424,695 | 2,903,815 |
| Conducting transportation | 1,324,927 | 1,371,844 | 9,476,851 |
| Traffic | 79 | 16 | 3,727 |
| General and miscellaneous | 117,476 | 179,322 | 796,459 |
| Loss on road retired | ........ | ........ | 8,185 |
| Total operating expense | $2,154,566 | $2,302,055 | $15,181,340 |
| Excess of income over operating expense | $790,025 | $758,443 | $7,424,827 |
| Less interest on funded debt | 215,088 | 205,723 | 2,178,739 |
| Excess of income over operating expenses and interest | $574,936 | $552,720 | $5,246,088 |
| Less reserve for depreciation and accidents (18 per cent of gross earnings) | 519,267 | 538,889 | 4,002,663 |
| Excess of income over operating expenses, interest, depreciation and accident reserves | $55,669 | $13,831 | $1,243,424 |
| Less charter comparison charges | 246,535 | 285,877 | 1,972,580 |
| Net income | *$190,866* | *$272,046* | *$729,156* |
| Analysis of comparison charges: | | | |
| *State franchise tax—4 per cent of gross earnings | $152,038 | $157,775 | $1,171,111 |
| †Municipal franchise tax—3 per cent of gross earnings | 86,544 | 119,753 | 697,231 |
| Municipal car license | 2,970 | 2,835 | 27,124 |
| Federal income tax | ....... | ....... | 13,271 |
| Salary of clerks | ....... | ....... | 4,872 |
| Law expenses | ....... | ....... | 13,500 |
| Insurance | 4,983 | 5,513 | 45,471 |
| Total | $246,535 | $285,876 | $1,972,580 |

* Franchise tax percentage has varied in different years.
† Municipal franchise tax now increased to 4 per cent.
Italics indicate loss or deficiency.

STATISTICAL DATA, MUNICIPAL RAILWAY OF SAN FRANCISCO—FISCAL YEAR ENDED JUNE 30, 1923

| | Total Amount | Per Car-Mile | Per Car-Hour | Ratio to Passenger Revenue |
|---|---|---|---|---|
| Total passenger revenue | $2,993,828.70 | $.3674 | $3.5091 | 1.00• |
| Total operating expenses (taxes and depreciation not included) | 2,302,055.28 | .2825 | 2.6983 | ...... |
| Total operating earnings (taxes and depreciation not included) | 691,773.42 | .0849 | .8108 | 0.2311 |
| Total taxes and charter charges | 285,876.50 | .0351 | .3351 | 0.0955 |
| Depreciation | 538,889.17 | .0661 | .6316 | 0.18 |
| Operating expenses, depreciation and taxes | 3,126,820.95 | .3837 | 3.6650 | 1.0444 |
| Net deficit from operation | *132,992.25* | *.0163* | *.1559* | 0.0442 |
| Platform expense (62½ cents per hour, eight-hour day) | $1,130,575.35 | .1387 | 1.3252 | ...... |
| Passenger car and bus mileage | 8,148,703.18 | | | |
| Passenger car and bus hours | 853,156.46 | | | |

| | Total Amount | Per Car-Mile |
|---|---|---|
| Number of passenger cars owned | 189 | |
| (Twenty additional cars under construction) | | |
| Number of work cars owned | 4 | |
| Total number of cars owned | 193 | |
| Total number of buses owned | 8 | |
| Total number of cars and buses owned | 201 | |

| | Total Amount | Per Car-Mile |
|---|---|---|
| Number of passengers carried— | | |
| 5-cent fares | 59,368,024 | |
| Government tickets—5-cent fares | 40,906 | |
| School tickets—2½-cent fares | 916,375 | |
| ‡Revenue transfers—2-cent fares | 329,479 | |
| Free transfers | 12,359,780 | |
| Free pass (employees, etc.) | 619,196 | |
| Total passengers carried | 73,633,760 | 9.04 |

‡ Transfers received at Fillmore and Union Streets treated as revenue transfers pending result of litigation. Italics indicate loss or deficiency.

panies but which the municipally owned utility is not required to pay. For the year these charges amount to $285,876, leaving a net deficit of $272,046. This compares with a similar deficit for the preceding year of $190,866.

There has been a continuing deficit, as shown by the cumulative income account for the period from Dec. 28, 1912, to June 30, 1923, amounting to $729,156, when the comparison charges are included. Neglecting these, there has been an excess of income over operating charges, interest and reserves of $1,243,424 for the same period.

Particular attention is given in the report to the explanation of the items in the balance sheet, which is reproduced in condensed form herewith. The capital assets consist of cash in bond funds, $17,428, which represents unexpended balance of the bond fund cash now in possession of the treasurer; road and equipment, $7,267,838, and general expenditures, $324,873. These latter accounts represent the total cost of the road and equipment, the net increase in the property account for the year being $465,201, consisting of $495,851 total additions less $30,650 for retiring twenty-four old Union Street cars.

The current assets consist of $991,682 cash in various funds, $1,033,384 for the book value of the securities bought for the account of the depreciation fund; accounts receivable, $11,362; materials and supplies, $204,968.

STATEMENT OF BUS LINE OPERATIONS, MUNICIPAL RAILWAY OF SAN FRANCISCO—YEAR ENDED JUNE 30, 1923

| | | | |
|---|---|---|---|
| Revenues: | | | |
| Passenger revenue | | $29,379.45 | |
| Quartermaster tickets | $0.55 | | |
| School tickets | 561.00 | | |
| Local transfers | 9,933.64 | 10,495.19 | |
| Total revenues | | | $39,874.64 |
| Operating Expenses: | | | |
| Repairs to buses | | $12,002.32 | |
| Tire expense | | 11,684.80 | |
| Conductors, Chauffeurs—buses | | 18,062.10 | |
| Garage expens. | | 13,306.21 | |
| Depreciation (18 per cent of receipts) | | 5,288.28 | |
| Compensation insurance | | 958.40 | |
| Total operating expenses | | | 61,302.11 |
| Net loss for year | | | $21,427.47 |
| Average net loss per day | | | 58.70 |

Deferred assets have not changed during the year.

On the liabilities side, the funded debt item represents the par value of the bonds outstanding in the hands of the public on June 30, 1923. Current liabilities include accounts and vouchers payable, $227,769 and interest due on funded debt, $115,358. The reserves include a reserve for depreciation of $1,508,327 and a reserve for compensation insurance of $107,413. The depreciation reserve includes the book value of securities in the depreciation fund, $1,033,384, and cash in the depreciation fund, $496,731; from this is deducted outstanding warrants of $21,788.

COMPARATIVE CONDENSED GENERAL BALANCE SHEET, MUNICIPAL RAILWAY OF SAN FRANCISCO, AS OF JUNE 30, 1923

| Assets | 1923 | 1922 | Increase or *Decrease* |
|---|---|---|---|
| Capital assets | $7,610,139 | $7,144,938 | $465,201 |
| Current assets | $2,241,396 | $2,378,146 | *$136,749* |
| Deferred assets | $132,123 | $131,123 | $1,000 |
| Total assets | $9,983,659 | $9,654,208 | $329,451 |
| Liabilities, Reserves and Surplus | | | |
| Funded debt | $4,192,000 | $4,390,100 | *$198,100* |
| Current liabilities | $343,127 | $327,340 | $15,787 |
| Reserves | $1,615,740 | $1,698,842 | *$83,101* |
| Contributed surplus | $332,553 | $332,553 | |
| Surplus from Income | $3,500,239 | $2,905,373 | $594,866 |
| Total surplus | $3,832,792 | $3,237,926 | $594,866 |
| Total liabilities, reserves and surplus | $9,983,659 | $9,654,208 | $329,451 |

Italics indicate loss or deficiency.

The municipal railway has no capital stock and the excess of its assets over its liabilities represents surplus. In the preparation of the balance sheet, it is stated, this surplus has been divided into two classes, first that which was created by donations or contributions and second, that which was accumulated from the earnings resulting from the operation of the road. The contributed surplus includes premiums realized from the sale of bonds, $26,000, and contributions from general taxes, $306,552. In surplus from income is included $1,289,000 representing bonds retired from income; $101,000 reserve for bond redemption. These amounts, totaling $1,390,000, represent the income which has been set aside in cash for the redemption of bonds, either actually redeemed and canceled or in the form of cash in the hands of the treasurer. Two items totaling $131,124 offset similar assets for the construction of the Twin Peaks and Stockton Street tunnels in deferred assets.

An item of considerable interest to railway operators is the charter reserve for insurance and taxes of $566,592. As explained previously, there are set aside certain sums for comparison with private operation, of which this item is a part. The municipal system not having to pay any of these charges, the receipts from operation were deposited in the operating cash fund without any restrictions as to how they were to be used. As a matter of fact, however, most of the cash in the operating fund represented by such comparison charges actually was expended in new construction and addition and betterment work, so that these reserves representing obligatory charter comparison charges have in reality been used for betterments. For the purpose of making the balance sheet reflect the actual results of operations, it is stated, the amount expended in addition and betterment work has been reflected in an account entitled "additions and betterments from income," and the charter reserves for insurance and taxes carry a balance equal only to the unused portion of the original income. The amount in the additions and betterments account is $1,897,001.

Operating surplus is made up as follows:

| | | |
|---|---|---|
| Surplus, June 30, 1922, as per last report | ....... | $211,407 |
| Add: | | |
| Reduction of compensation insurance reserve corresponding to dividends declared by the state compensation insurance fund adjustment | $25,713 | |
| Transfers from depreciation fund to operating fund | 37,867 | 63,580 |
| | | *$147,827* |
| Deduct: | | |
| Amount transferred from income account | *272,046* | |
| Interest on bonds credited to income but deposited in the depreciation fund | *55,297* | |
| Reconstruction of roadbed, Columbus Avenue | *9,307* | *$336,650* |
| Italics indicate loss or deficiency. | | *$484,477* |

The statement of bus line operations for the year shows total revenues of $39,875 and expenses of $61,302, giving a net loss for the year of $21,427. This compares with a net loss of $29,086 in 1922 on a total gross of $38,863. These figures, however, do not include any supervision or other overhead or comparison charges.

The following table summarizes the operating statistics for the bus lines for the last two fiscal years:

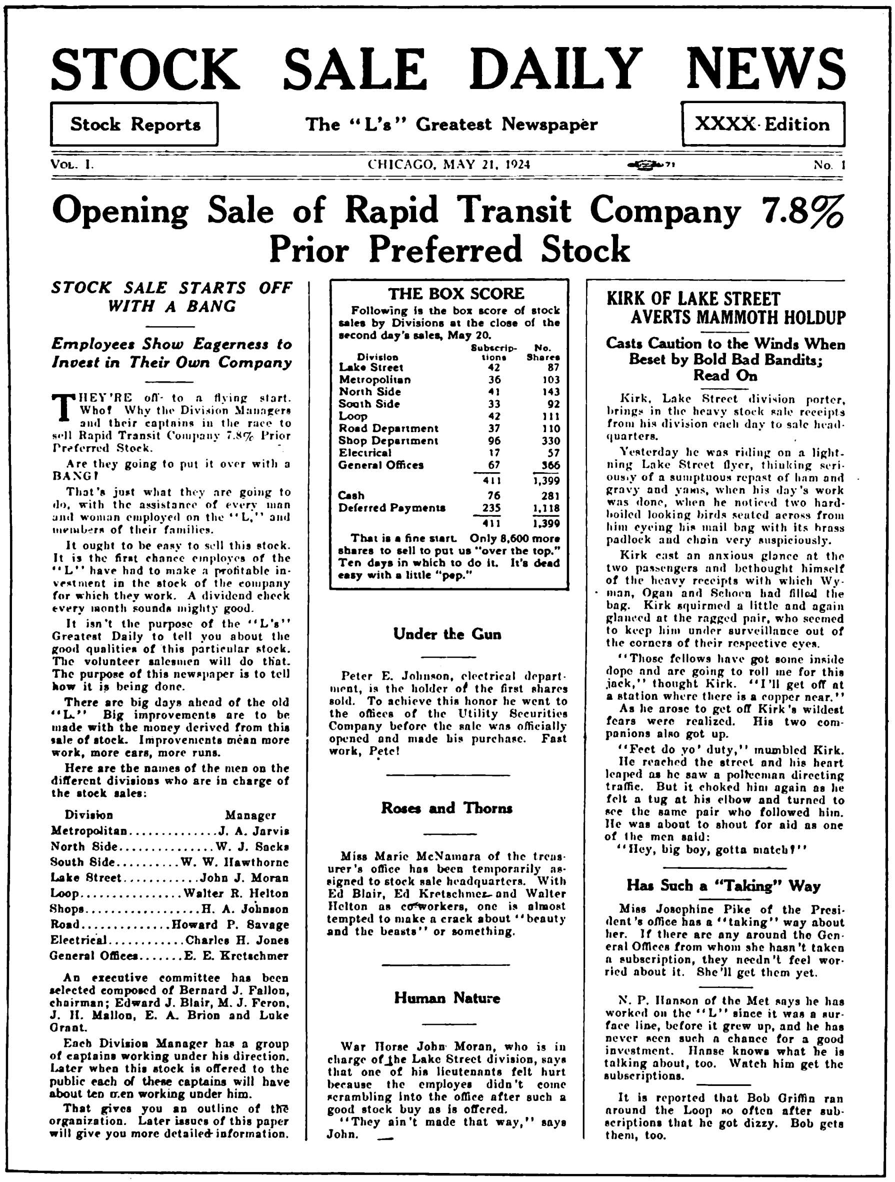
| | 1923 | 1922 |
|---|---|---|
| Receipts | $29,379 | $28,565 |
| Bus-hours | 28,106 | 28,189 |
| Receipts per bus-hour | $1.05 | $1.01 |

## $500,000 Stock Taken by Chicago "L" Employees in Week

At the end of the first week of the campaign by the Chicago Rapid Transit Company to sell its new issue of $5,000,000 prior preferred 7.8 per cent stock, employees of the company, on the basis of incomplete returns, had purchased practically $500,000, par value, of the issue. This is half of the total amount of $1,000,000 of the new stock which was set aside for the employees and which, under the plan adopted, they have the exclusive right to purchase on favorable terms until after June 1. From the sales made during the first week, those in charge of the marketing of the securities are inclined to believe that the employees of the company will quickly absorb the total amount set aside for them. After June 1 the stock will be offered to the general public at par, with employees acting as salesmen.

An interesting feature of the sale is a daily newspaper issued by the central executive committee. This gives the up-to-the-minute news of the progress of the campaign.

Division of the company into sections to stimulate competition has created a great deal of interest in all departments. The returns are tabulated as fast as possible after they are received in the headquarters established for the stock sales. These results are then posted on a large bulletin board extending across the entire end of the room, giving it much the appearance of a broker's office. The data are posted by divisions and are analyzed so as to show for each division the total number of employees, total number of sales and total shares of stock sold. In this way interesting facts about sales are compiled, and these comparisons help to stimulate and maintain the enthusiasm which has been manifested by the various salesmen and other employees taking part in the campaign.



STOCK SALE DAILY NEWS

Stock Reports — The "L's" Greatest Newspaper — XXXX Edition

Vol. 1. CHICAGO, MAY 21, 1924 No. 1

Opening Sale of Rapid Transit Company 7.8% Prior Preferred Stock

*STOCK SALE STARTS OFF WITH A BANG*

*Employees Show Eagerness to Invest in Their Own Company*

THEY'RE off to a flying start. Who? Why the Division Managers and their captains in the race to sell Rapid Transit Company 7.8% Prior Preferred Stock.

Are they going to put it over with a BANG?

That's just what they are going to do, with the assistance of every man and woman employed on the "L," and members of their families.

It ought to be easy to sell this stock. It is the first chance employes of the "L" have had to make a profitable investment in the stock of the company for which they work. A dividend check every month sounds mighty good.

It isn't the purpose of the "L's" Greatest Daily to tell you about the good qualities of this particular stock. The volunteer salesmen will do that. The purpose of this newspaper is to tell how it is being done.

There are big days ahead of the old "L." Big improvements are to be made with the money derived from this sale of stock. Improvements mean more work, more cars, more runs.

Here are the names of the men on the different divisions who are in charge of the stock sales:

| Division | Manager |
|---|---|
| Metropolitan | J. A. Jarvis |
| North Side | W. J. Sacks |
| South Side | W. W. Hawthorne |
| Lake Street | John J. Moran |
| Loop | Walter R. Helton |
| Shops | H. A. Johnson |
| Road | Howard P. Savage |
| Electrical | Charles H. Jones |
| General Offices | E. E. Kretschmer |

An executive committee has been selected composed of Bernard J. Fallon, chairman; Edward J. Blair, M. J. Feron, J. H. Mallon, E. A. Brion and Luke Grant.

Each Division Manager has a group of captains working under his direction. Later when this stock is offered to the public each of these captains will have about ten men working under him.

That gives you an outline of the organization. Later issues of this paper will give you more detailed information.

THE BOX SCORE

Following is the box score of stock sales by Divisions at the close of the second day's sales, May 20.

| Division | Subscriptions | No. Shares |
|---|---|---|
| Lake Street | 42 | 87 |
| Metropolitan | 36 | 103 |
| North Side | 41 | 143 |
| South Side | 33 | 92 |
| Loop | 42 | 111 |
| Road Department | 37 | 110 |
| Shop Department | 96 | 330 |
| Electrical | 17 | 57 |
| General Offices | 67 | 366 |
| | 411 | 1,399 |
| Cash | 76 | 281 |
| Deferred Payments | 235 | 1,118 |
| | 411 | 1,399 |

That is a fine start. Only 8,600 more shares to sell to put us "over the top." Ten days in which to do it. It's dead easy with a little "pep."

Under the Gun

Peter E. Johnson, electrical department, is the holder of the first shares sold. To achieve this honor he went to the offices of the Utility Securities Company before the sale was officially opened and made his purchase. Fast work, Pete!

Roses and Thorns

Miss Marie McNamara of the treasurer's office has been temporarily assigned to stock sale headquarters. With Ed Blair, Ed Kretschmer and Walter Helton as co-workers, one is almost tempted to make a crack about "beauty and the beasts" or something.

Human Nature

War Horse John Moran, who is in charge of the Lake Street division, says that one of his lieutenants felt hurt because the employes didn't come scrambling into the office after such a good stock buy as is offered.

"They ain't made that way," says John.

KIRK OF LAKE STREET AVERTS MAMMOTH HOLDUP

Casts Caution to the Winds When Beset by Bold Bad Bandits; Read On

Kirk, Lake Street division porter, brings in the heavy stock sale receipts from his division each day to sale headquarters.

Yesterday he was riding on a lightning Lake Street flyer, thinking seriously of a sumptuous repast of ham and gravy and yams, when his day's work was done, when he noticed two hard-boiled looking birds seated across from him eyeing his mail bag with its brass padlock and chain very suspiciously.

Kirk cast an anxious glance at the two passengers and bethought himself of the heavy receipts with which Wyman, Ogan and Schoen had filled the bag. Kirk squirmed a little and again glanced at the ragged pair, who seemed to keep him under surveillance out of the corners of their respective eyes.

"Those fellows have got some inside dope and are going to roll me for this jack," thought Kirk. "I'll get off at a station where there is a copper near."

As he arose to get off Kirk's wildest fears were realized. His two companions also got up.

"Feet do yo' duty," mumbled Kirk.

He reached the street and his heart leaped as he saw a policeman directing traffic. But it choked him again as he felt a tug at his elbow and turned to see the same pair who followed him. He was about to shout for aid as one of the men said:

"Hey, big boy, gotta match?"

Has Such a "Taking" Way

Miss Josephine Pike of the President's office has a "taking" way about her. If there are any around the General Offices from whom she hasn't taken a subscription, they needn't feel worried about it. She'll get them yet.

N. P. Hanson of the Met says he has worked on the "L" since it was a surface line, before it grew up, and he has never seen such a chance for a good investment. Hanse knows what he is talking about, too. Watch him get the subscriptions.

It is reported that Bob Griffin ran around the Loop so often after subscriptions that he got dizzy. Bob gets them, too.

**First Page of First Issue of Paper Published in Chicago Stock Campaign**

## New York Railways' Property Ordered Sold

As a step in the reorganization of the New York Railways, New York City, the property of the company and its subsidiaries is advertised for sale on the morning of July 7. The sale is in the action brought by merchandise creditors against the company.

Among the parcels to be sold are the franchises and railroads of the South Ferry Railroad, the Lexington Avenue & Pavonia Ferry Railroad, the Central Crosstown Railway, the Chambers & Grand Street Ferry Railroad, the Metropolitan Crosstown Railway, the Metropolitan Street Railway and the Columbus & Ninth Avenue Railway. In addition there are a number of parcels of real estate.

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**Auction Sales in New York.**—At the public auction rooms of A. H. Muller & Sons there were sold this week $3,000 of Interborough-Metropolitan Company collateral trust 4½ per cent gold bonds; receipt for deposit certificate; $15 lot.

**Service to Be Discontinued.**—Service supplied by the Blue Ridge Traction Company, Danielsville, Pa., will be discontinued on June 1. Notices to this effect have been posted at stations along the line by the Sofranscy Company of Allentown, which recently purchased it from the trustees. On the above date work will begin on the dismantling of the entire line, which runs from Walnutport to Danielsville.

**Net Corporate Income, $28,232.**—The Stockton Electric Railroad, operating in Stockton, Cal., reports to the Railroad Commission for the year 1923 that its operating revenue was $335,484 and operating expenses $278,794, giving a net operating revenue of $56,690. The net corporate income for the year was $28,232. The surplus at the begining of the year amounted to $397,410. Miscellaneous additions to surplus for 1923 amounted to $2,035, and miscellaneous deductions were $89, leaving an accumulated surplus at the end of the year of $427,638.

**Seeks Partial Discontinuance.**—Application for permission to discontinue the operation of trolley cars between Pennington and Hopewell, N. J., has been filed with the Public Utility Commission by the Trenton & Mercer County Traction Corporation. The company wants to operate buses in places of trolleys. The route is 5.6 miles. The traction company argues that the route has annually shown a considerable deficit, amounting in 1923 to $7,000; that continued operation of the cars would mean the necessity of paying in the next year or two a total of $50,000 for the reconstruction of pavements in Pennington and Hopewell, and that no hope of any appreciable increase in traffic seems to exist.

**Refunding Mortgage Bonds Offered.**—The National City Company and Halsey, Stuart & Company, New York, are offering at 94 and interest to yield more than 6½ per cent $3,500,000 first lien and refunding mortgage gold bonds of the Portland Eectric Power Company, Portland, Ore. The bonds, known as Series B, 6 per cent, are dated May 1, 1922, and are due May 1, 1947. A mortgage provides for a sinking fund requiring cash payments of at least $450,000 each year for the purpose of purchasing or redeeming first lien and refunding mortgage bonds, of which $15,388,500, will be outstanding, including this issue.

# Personal Items

## F. T. Griffith Heads N. E. L. A.

Franklin T. Griffith, president of the Portland Electric Company, Portland, Ore., formerly the Portland Railway, Light & Power Company, was elected president of the National Electric Light Association at the annual meeting of that body in Atlantic City during the week ended May 24. Mr. Griffith has been president of the company at Portland since 1913. He is a lawyer by profession, and as chairman of the water power development committee of the N. E. L. A., he has untiringly worked to bring about far-sighted interpretations of these laws with working rules and regulations so that the most beneficial results might be obtained. He was born in Minneapolis in 1870 and was admitted to the bar in 1894 having qualified for the legal profession while he was supporting himself. He handled legal matters for the company at Portland before he was elected an officer of the company. He has been an N. E. L. A. vice-president since 1920.

## W. C. Peters Sales Manager National Railway Appliance

W. C. Peters has been appointed manager of sales and engineering of the National Railway Appliance Company, New York. "Bill" Peters has been manager of the New England office of that company for the last four years. His new position gives him supervision of the sales forces in New York, Boston, Washington and Chicago, where district offices are maintained.

Mr. Peters received his technical training at the Worcester Polytechnic Institute. In June, 1911, he entered the employ of the Boston & Albany Railroad as a special apprentice in the locomotive shops at West Springfield, Mass., gradually advancing to the position of assistant mechanical engineer in the office of the superintendent of motive power at Boston. This position he held until America's entrance into the World War, going overseas in July, 1917, with the Fourteenth Engineers (Light Railway) serving as first lieutenant, and subsequently returning to his former position with the Boston & Albany Railroad. In April, 1920, he joined the National Railway Appliance Company as representative in the New England territory, with headquarters at Boston.

F. M. Richards has been selected to fill the vacancy in the New England territory caused by Mr. Peters' change to the main office of the National Railway Appliance Company in New York. Mr. Richards, previous to this change to the Boston office, was connected with the New York office of the company. This new territory will be familiar to Mr. Richards as he formerly was connected with the Atlantic Shore Line Electric Railway at Kennebunk, Me., in the capacity of electrical engineer.

**William G. Boteler**, superintendent of the Coast Cities Railway, formerly the Atlantic Coast Electric Railway, Asbury Park, N. J., has tendered his resignation. Mr. Boteler had been with the Asbury Park company for the past three years, having formerly been in charge of the now defunct Monmouth County Electric Company, operating between Long Branch and Red Bank, N. J. George B. Cade, assistant to the president of the Coast Cities, is temporarily discharging the duties of the position made vacant by the resignation of Mr. Boteler.

**L. D. Albin**, formerly general sales manager of the Ingersoll-Rand Company, New York City, has been elected vice-president in charge of European sales of that company. D. C. Keefe, formerly assistant general sales manager, has been appointed to succeed Mr. Albin as general sales manager.

**R. B. Gummit** is now superintendent of the Intercity Terminal Railway, North Little Rock, Ark. He was formerly assistant superintendent of the railway department of the Arkansas Central Power Company.

**William E. Boyd, Jr.**, of Wheeling, W. Va., has just been promoted to the position of superintendent in charge of the Steubenville district of the Wheeling Traction system of the West Penn interests, which includes the Wheeling-Steubenville division, the Steubenville-Weirton division and the Steubenville-Mingo-Brillian division as well as a number of smaller lines. Mr. Boyd entered the service as a conductor. He was promoted to assistant train dispatcher, then to assistant superintendent and finally to superintendent of the Steubenville division. He has been identified with the Wheeling Traction Company for a number of years. During the World War Mr. Boyd was attached to the sixty-third engineers. Before entering the service of the Wheeling Traction Company he was connected with the Wheeling *News and Intelligencer*.

**John V. Strange** has been appointed operating manager of the Carolina Power & Light Company, Raleigh, N. C. He was for a number of years assistant general manager of the Pacific Power & Light Company, Astoria, Ore.

**Elbert H. Henning** has resigned as superintendent of the Niagara Falls local lines and the Park & River division of the International Railway, Buffalo. He has held that position for twelve years. Mr. Henning had been in the employ of the International Railway for twenty-seven years. Until the appointment of a general superintendent of interurban divisions of the International with headquarters at Niagara Falls six months ago, Mr. Henning was superintendent of the Buffalo-Niagara Falls, Buffalo-Lockport and Lockport-Olcott interurban divisions of the International Railway. He started as a conductor on the International lines and worked his way up through the ranks. He has made no plans for the future. Mr. Henning's successor has not yet been named. The duties of the office which Mr. Henning vacates will be taken over temporarily by the superintendent of the interurban division.

**R. D. Beard**, formerly secretary and treasurer of the Fort Smith Light & Traction Company, Fort Smith, Ark., is now with the Northern States Power Company as supervising auditor with headquarters in Minneapolis, Minn.

**R. A. Prichard** has been appointed assistant superintendent of the railway department of the Arkansas Central Power Company, Little Rock, Ark. Mr. Prichard has been associated with the Arkansas Central Power Company for the past twenty years. He entered the service as conductor.

**Dr. Wilhelm Mattersdorf** and **Wilhelm Stein** of the Hamburg Elevated Railway, who have been in this country on a short visit, returned to Germany on May 28. In company with Gustave Leo, chief of the Hamburg state civil engineering department, they inspected a number of rapid transit lines and electric railways in the larger cities of this country. Dr. Mattersdorf, before sailing, said that the trip had been very instructive and that the delegation hoped, after its return, to make use of the impressions derived.

# Obituary

## John E. Harvell

John E. Harvell, division manager of the Virginia Railway & Power Company, died recently at his home in Petersburg, Va., after a long illness. Mr. Harvell had been with the company for many years and was in charge of its railway operations in Petersburg, in Richmond and on the company's Petersburg-Richmond interurban line.

Mr. Harvell's experience extended over thirty-seven years in construction work and in the operation of railway, light and power activities. It was in 1887 that he secured his first job as a lineman with the Upper Appomattox Company, a pioneer water company. A few years later he was made assistant superintendent and still later was promoted to the position of superintendent of operations. In 1898 when the interurban line was put into operation between Richmond and Petersburg, Mr. Harvell was placed in charge of the service. Later his best attention was given to hydraulic power development which was being made on the Appomattox River, but in 1909 when the Virginia Railway & Power Company was organized he continued in charge of the operations of the interurban and Petersburg city lines. From then on he became steadily more prominent in both the railway and light and power departments until in the fall of 1921 he assumed new duties as general manager of the Richmond-Petersburg division of the property, succeeding C. B. Buchanan; but continuing to have full charge of the company's light and power business throughout the entire system.

# Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

## Regulation from Within

### Can Abuses Which Give Rise to Government in Business Be Eliminated by the Voluntary Action of the Industry Itself?

The advancement of science and our increasing population require constantly new standards of conduct and breed an increasing multitude of new rules and regulations, according to Herbert Hoover, Secretary of Commerce, speaking before the recent annual meeting of the United States Chamber of Commerce at Cleveland. A host of such regulations are necessary to maintain human rights in this industrial era. The question to consider is whether these restrictions are to be developed solely by government or whether they cannot in some large part be developed by voluntary action of business.

No one disputes the necessity for constantly new standards of conduct in relation to our modern tools and inventions. Our public utilities are wasteful and costly unless we give them a privilege more or less monopolistic. At once when we have business affected with monopoly we must have regulation by law. Much of even this phase might have been unnecessary had there been a higher degree of responsibility to the public, higher standards of business practice among those who dominated these agencies in years gone by.

There has been, however, a great extension of government regulation beyond the field of public utilities into the fields of distribution of commodities and credit. When legislation penetrates the business world it is because there is abuse somewhere. A great deal of this legislation is due rather to the inability of business to so organize as to correct abuses, rather than to any lack of desire to have it done.

The vast tide of these regulations that is sweeping onward can be stopped if it is possible to devise out of the conscience and organization of business itself those restraints which will cure abuse, eliminate waste and prevent unnecessary hardship in the working of our economic system. It is vitally necessary that we stem this tide if we would preserve that initiative in men which builds up the character, intelligence and progress of our people.

Practically our entire American working world is now organized into some form of economic association. We have trade associations and trade institutes embracing particular industries and occupations. We have chambers of commerce embracing representatives of different industries and commerce. We have the labor unions representing the different crafts. We have associations embracing all the different professions—law, engineering, medicine, banking, real estate, and what not. We have farmers' associations, and we have the enormous growth of farmers' co-operatives for actual dealing in commodities. Of indirect kin to this is the great increase in ownership of industries by their employees and customers, and again we have a tremendous expansion of mutualized insurance and banking.

Association activities are the promising machinery for much of the necessary determination of ethical standards. We have in them not only the agencies by which standards can be set but by co-operative action among the associations representing the different stages of production, distribution and use we can secure a degree of enforcement far wider than mere public opinion in a single trade. When standards are agreed upon by the associations representing the manufacturer and distributor and those representing the user we have a triple force interacting for their enforcement.

## Business Holding Up Well

Business as a whole, measured by any other than the peak standards of 1920 and early 1923, is still at a fairly high level. This is the conclusion reached by the Guaranty Trust Company, New York, based on wide study by its experts anticipatory of the coming summer season.

Changes which are taking place were easy to forecast. The readjustments were not unexpected. The persistence of generally cautious buying by distributors and the close conformity of production with current scales of consumption, as well as the maintenance of an unusually strong position of the banks, have preserved the bases for orderly changes now under way.

The continued ease in the money market represents a credit situation markedly different from that obtaining in the latter part of 1920. There is no possibility of such drastic financial readjustments as were then necessary.

During the greater part of the period since the spring of 1923 the trend of the general level of commodity prices has been distinctly downward. Such a trend is commonly characterized by narrowing profit margins, smaller trade volume and reduced demand for labor, with a consequent decline in wage levels. The peculiarity of the situation during the last year lies largely in the relation between the movements of different groups of commodity prices, which has been such as to prevent a general drastic reduction of profit margins. While wage levels, representing one important group of costs, have been high, the prices of raw materials and other producers' goods, representing another group of costs, have declined with relative rapidity.

The survey says it is apparent that the present conflicting tendencies cannot go on indefinitely. With commodity prices declining and wage levels rising, the cost of labor is becoming an increasingly important factor in the ultimate prices of consumers' goods. This fact is reflected in the growing disparity between prices of commodities in the different stages of production and distribution. The longer these contrary movements persist, the more difficult it will be for employers to operate at a profit, and the stronger will become the resistance to further wage advances.

The anomaly in present conditions lies not so much in the relative positions of wages and prices as in the directions of their movements. Rising wage scales normally exert a strong upward pressure on the price level, both by increasing the demand for consumers' goods and by raising the costs of producing them. At the same time, declining commodity prices tend to lower wages by making it unprofitable to employ labor at existing levels. The bank sees wage reductions as inevitable if the present decline in commodity prices continues. The hope is expressed that workers will recognize the necessity of revising wage scales to conform to the movement of prices.

## Large Lumber Cut in 1923

The lumber cut in 1923 of 733 large sawmills, reporting to the Census Bureau, shows a rate of increase over the cut of the same mills in 1922 of 13.9 per cent, according to the United States Department of Commerce.

These mills contributed 47.3 per cent of the total reported cut of all mills in 1922, on which basis the reported cut for 1923 will equal 36,000,000,000 feet, or the largest reported since 1914.

In 1920 the Forest Service estimated that the total cut of lumber was 33,800,000,000 feet on the basis of 29,878,360,000 feet as reported by 15,978 mills. On the same relative basis, the total cut of the country in 1923 would be the largest since 1913.

The figures for 1923 from 733 mills are considered by the Census Bureau as indicating with fair accuracy the conditions prevailing in the industry in the important lumber regions, since the mills to which they relate are distributed in twenty-eight states and contributed 47.3 per cent of the total cut of all mills reporting for 1922. All but two states, Louisiana and Missouri, show increases for 1923 over the output of the preceding year.

## Metal, Coal and Material Prices

| **Metals—New York** | May 27, 1924 |
|---|---|
| Copper, electrolytic, cents per lb. | 12.75 |
| Copper wire base, cents per lb. | 15.25 |
| Lead, cents per lb. | 6.95 |
| Zinc, cents per lb. | 6.16 |
| Tin, Straits, cents per lb. | 41.50 |
| **Bituminous Coal, f.o.b. Mines** | |
| Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons | $4.425 |
| Somerset mine run, Boston, net tons | 2.175 |
| Pittsburgh mine run, Pittsburgh, net tons. | 1.875 |
| Franklin, Ill., screenings, Chicago, net tons | 2.175 |
| Central, Ill., screenings, Chicago, net tons. | 1.625 |
| Kansas screenings, Kansas City, net tons. | 2.50 |
| **Materials** | |
| Rubber-covered wire, N. Y., No. 14, per 1,000 ft. | $6.36 |
| Weatherproof wire base, N.Y., cents per lb. | 17.25 |
| Cement, Chicago net prices, without bags. | $2.20 |
| Linseed oil (5-bbl. lots) N. Y., per gal. | $0.97 |
| White lead, in oil (100-lb. keg), N. Y., cents per lb., carload lots. | 12.25 |
| Turpentine, (bbl. lots), N. Y., per gal. | $0.88 |

## Fifty New Steel Subway Cars Being Delivered

Delivery of fifty new subway cars has been begun by the Pressed Steel Car Company of Pittsburgh in fulfillment of the order filed last summer by the Brooklyn-Manhattan Transit Corporation. Gerhard M. Dahl, chairman of the executive committee of the railway, says that about twenty of these are to be used on the western half of the new Fourteenth Street-Eastern Subway line, operation of which he believed would be begun about July 1.

The Brooklyn company has agreed to operate the western half of the Fourteenth Street-Eastern line as soon as it is equipped, in order to provide rapid transit to Fourteenth Street and Sixth Avenue, Manhattan, for the residents of the vicinity of North Seventh Street, Metropolitan Avenue and Bushwick Avenue, as far east as Montrose Avenue. It is not anticipated by the company officials that operation of this portion of the Fourteenth Street-Eastern line will relieve congestion at Canal Street. The congestion at that point is almost entirely due to the fact that the city has not completed the Fourteenth Street-Eastern line to East New York, as it agreed to do in 1913, where the line would connect with the Canarsie and Jamaica lines.

## *Rolling Stock*

**Baltimore & Ohio Railroad, Baltimore, Md.**, acting for the Staten Island Rapid Transit Railway, has asked for bids for eighty electric multiple-unit cars in accordance with the general design described and illustrated in the ELECTRIC RAILWAY JOURNAL for May 17, page 776. The specifications for the cars, motors, control, airbrakes, etc., were approved by the Public Service Commission and the New York Transit Commission before inquiries were sent out for bids. Some questions still remain to be settled regarding the trucks. Further conferences regarding this matter will be held with the commission after the bids have been received on the equipment. The new cars will be 47 ft. between truck centers and 67 ft. over the buffers.

**New York, New Haven & Hartford Railroad, New York, N. Y.**, has been authorized by the Interstate Commerce Commission to issue equipment notes in the sum of $1,043,000 to provide funds to be applied to the purchase from the Westinghouse Electric & Manufacturing Company of twelve electric locomotives, which are to cost $1,589,700.

**Detroit United Lines, Detroit, Mich.**, has added to its freight equipment fifty new trail cars, 47 ft. 6 in. long, 7 ft. 5$\frac{3}{8}$ in. wide, and 7 ft. 1$\frac{7}{16}$ in. high. Ten of these cars are equipped with staggered side doors 10 ft. in width for automobile shipments and other traffic that cannot be handled through the ordinary side doors. The cars are of 80,000 lb. capacity with steel underframes. The company now has forty motor cars, thirteen of which are of the heavy locomotive type capable of hauling from five to fifteen trail cars, and 133 freight trail cars, most of which are aproximately the same dimension as the fifty new cars. All of the freight trail cars of the Detroit United Lines are available for loading to all points reached by electric railways in the central states as far distant as Terre Haute, Ind.; Louisville, Ky.; Cincinnati, Cleveland, Canton, Akron and Youngstown.

**Houston Electric Company, Houston, Tex.**, has purchased the fifteen cars which it announced it would do early in the present year. The prospective order was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 26, 1924. The detailed specifications follow:

| | |
|---|---|
| Date of delivery | Aug. 1, 1924 |
| Builder of car body | American Car Company |
| Type of car | Double-truck Birney cars |
| Seating capacity | 44 |
| Length over all | 41 ft. 1 in. |
| Truck wheelbase | 5 ft. 1½ in. |
| Width over all | 8 ft. 5 in. |
| Height, rail to trolley base | 15 ft. 5 in. |
| Body | All steel |
| Interior trim | Light colored mahogany |
| Roof | Arch |
| Air brakes | Westinghouse |
| Car signal system | Faraday |
| Control | K 35, double end |
| Curtain material | Pantasote |
| Destination signs | Hunter |
| Door-operating mechanism, | St. Louis pneumatic |
| Fare boxes | Johnson |
| Fenders | H. B. lifeguards |
| Gears and pinions | Helical |
| Hand brakes | Peacock |
| Headlights | Golden Glow |
| Motors | 4 Westinghouse No. 508 |
| Registers | Dapron air register |
| Sash fixtures | O. M. Edwards, No. 13 |
| Seats | Brill Waylo special |
| Seating material | Canvas lined rattan |
| Slack adjuster | American Brake, Type E |
| Step treads | Feralun |
| Trolley catchers | Keystone |
| Trolley base | Simplex No. 3 |
| Trucks | Brill No. 77 E |
| Ventilators | Utility |
| Wheels | Davis Steel, 26 in. |
| Power-saving device | Economy meters |

**Houston Electric Company, Houston, Tex.**, expects to purchase ten additional buses similar to the ones now in operation and each seating twenty-nine passengers.

**Southern Canada Power Company, Montreal, Canada**, has purchased from the F. B. Cutter Company, 50 Church Street, New York City, a number of one-man, single-truck Birney safety cars which will be put in service at Sherbrooke, Canada.

**Cincinnati & Dayton Traction Company, Hamilton, Ohio**, through Receiver Sohngen has been authorized to purchase six new cars of the one-man type by the Montgomery County Common Pleas Court. The total cost is $39,492, of which 25 per cent will be paid in cash. The cars will be installed on the Hamilton city lines.

## *Track and Line*

**Los Angeles Railway, Los Angeles, Cal.**, has started reconstruction of Forty-eighth Street from Van Ness to Sixth Avenue. New girder rail will be used.

**Kansas City Railways, Kansas City, Mo.**, was granted permission on May 19 by the upper house of the Kansas City Council to construct a double-track loop around Muehlebach Field. Twentieth Street to Twenty-second Street and Euclid Avenue to Brooklyn Avenue. The plan includes the purchase of two lots at the northwest corner of Twenty-second Street and Euclid Avenue on which are to be constructed a loading platform and a loop. The total cost of the improvements will be $39,800, to be divided as follows: $34,800 for the double tracks, $3,000 for the loading platform and $2,500 for the lots. The plan to carry out this improvement was reviewed in the ELECTRIC RAILWAY JOURNAL for May 24, page 836.

**Knoxville Power & Light Company, Knoxville, Tenn.**, expects to rebuild its tracks on Jackson Street.

**Department of Street Railways, Detroit, Mich.**, will lay 2 miles of single track on Stotten Avenue and about 2 miles of single track on Warrent Avenue. In addition, 1 mile of double track on Grand River Avenue is to be reconstructed. All new track is being laid with 100-lb. A. R. A. 6-in. rail on twin steel ties in a monolithic concrete bed 14½ in. deep. This is the standard construction in Detroit.

## *Trade Notes*

**C. D. Price**, for many years connected with the Industrial Works at Bay City, Mich., recently as traveling service engineer, has been appointed district sales manager of the St. Louis district with headquarters at the Railway Exchange Building, St. Louis.

**White Manufacturing Company, Goshen, Ind.**, is building a new factory and adding to its equipment so that it can better take care of its business.

**H. E. Listman**, formerly manager of the motor coach division of the Garford Motor Truck Company, has joined the Yellow Coach forces at Chicago as assistant general sales manager, reporting to G. T. Seeley.

**Railway Service & Supply Corporation, Indianapolis, Ind.**, has filed its certificate of incorporation in the office of the Secretary of State at Albany and will engage in business in New York State. The corporation, of which James P. Goodrich is president, is capitalized at $400,000 and will dispense railway service and supplies. Its New York office is Buffalo, N. Y. Mote & Goodrich, Indianapolis, are its attorneys.

**Conveyors Corporation of America, Chicago, Ill.**, has announced that, effective May 1, Colwell & McMullin, its New England representatives, will be located in new offices in the Park Square Building, Boston. Colwell & McMullin handle the sales of American steam jet ash conveyors, American airtight doors, and other power plant specialties in Boston and the New England states.

**C. H. Smith**, assistant secretary of the Westinghouse Air Brake Company and director of clerical operations of all that company's interests, has, in addition, been elected vice-president of the Westinghouse Union Battery Company, Swissvale, Pa., subsidiary of the Westinghouse Air Brake Company. Mr. Smith began his connection with the Air Brake Company in 1900. Mr. Smith is a recognized authority on cost accounting and is prominent in the national councils of a number of business organizations.

New York, June 7, 1924

# Electric Railway Journal

*Consolidation of Street Railway Journal and Electric Railway Review*
Published by McGraw-Hill Company, Inc.
HENRY W. BLAKE and HARRY L. BROWN, *Editors*

*Volume 63*
*Number 23*

## A Milestone in Railroad Electrification

SO MUCH publicity has been given in recent years to the things that would be accomplished by projected electrification of steam railroad trunk lines that there has perhaps been a tendency to overlook the actual accomplishments of roads already under electric operation. Of course, a projected improvement involving the expenditure of large sums of money is big news to the general press, whereas a continuing performance in a more or less routine manner is seldom given space.

As a matter of fact, there are quite a few very successful electrifications in this country and abroad that have continued to give excellent service over a considerable period of years. Occasionally the record has been printed in the technical papers, but in general little is heard of the success of these installations.

One railroad that obtained a great deal of publicity in the early stages of main-line electrification was the New York, New Haven & Hartford. Many predictions, favorable and adverse, were given, and for a time its operating records were printed. After a few years it passed out of the public eye, and became a part of the accepted routine. In this capacity the public has merely expected it to do its part in giving 100 per cent service day after day.

The New Haven has not been standing still, however. Extensions of the electrified zone have been made from time to time and new equipment has been added. The outstanding feature of the installation has been its reliability in all kinds of weather and its ability to handle any burden put on it. It has made an excellent record in the 17 years of service since electric operation began in 1907.

If financial misfortune had not intervened, much more rapid progress might have been made in electrification. But the operating management has kept on, adding bit by bit, until now all trains, both freight and passenger, in the entire district between New York and New Haven are operated electrically, except for a few which run a short distance from the New Haven freight yard to a branch line. This is the first case where all switching, all freight and all passenger movements over a large section of a main-line railroad have been entirely done without the assistance of any steam locomotives. It will now afford the best example to date from which to derive statistics as to the results that may be expected from complete electrification, as up to the present time it has never been possible to obtain data that did not comprise steam operation to some extent. Thus the recent accomplishment of the New Haven Railroad not only marks a milestone in the progress of that road, but a milestone of importance to electrification in general.

## Tell This to the Motorists Who Pick Up Railway Patrons

THE outcome of a recent lawsuit in New York calls attention again to the responsibilities incurred by an automobilist who gives a lift to a person waiting for a street car. In the case in question the plaintiff claimed damages for injuries suffered while he was riding as a guest in the automobile of the defendant. The case was settled out of court by the payment of substantial damages.

The general principle has been established in New York that the owner or operator of an automobile owes to an invited guest the duty to exercise reasonable care in its operation, and not unreasonably to expose him to danger or injury by increasing the hazard of travel. A guest is entitled to recover from the owner for an injury resulting from a failure to use such care. The fact that the owner of the automobile is not a common carrier, and is not transporting a passenger for hire, does not relieve him of responsibility. In order for the guest to recover damages, however, he must show negligence or carelessness on the part of the owner.

If it becomes generally understood that giving a lift to another person may, in case of accident, involve the automobile driver in more serious difficulty than if he were alone, this may act as a determent to such generosity—which is a serious form of competition for street railways, especially in smaller cities.

## Railways Should Not be Blamed for Delays Caused by Parades

THIS is the season of parades. Decoration Day has just passed and the Fourth of July looms ahead. Circuses are now on tour and June brings with it the great political conventions and consequent demonstrations. These parades will be held on the principal streets of various cities, resulting in serious interruptions to electric railway service, and the companies will be unfairly blamed for these delays.

If the public understood exactly what a parade meant in the way of interruption to street car service it might diminish the enthusiasm for the spectacle. Should the railway suffer a breakdown such that no cars moved for a couple of hours, an outcry from the angry populace would be heard from one end of the town to the other. Criticism of the trolley company would be on every tongue. It would be considered an outrage that people should be deprived of transportation for so long a time. Yet the municipal authorities in order to please a comparatively small group of people, a fraternal, religious or political organization, allow a parade to be held where it completely disrupts the trolley service.

Certainly there is no good reason why a parade should be given preference over street railway operation—why a large number of people should be discommoded to please a few. If an interruption to service resulting from some neglect on the part of the railway is considered reprehensible, why isn't an interruption to service resulting from the politician's desire to gratify a particular group of people equally undesirable? Here is a chance to apply the publicity policy mentioned in an editorial in the JOURNAL on May 24. If the railway, after a long delay caused by a parade, tells the public just what caused the delay, it will lessen the criticism directed at the company and may eventually result in a reduction in the number of parades.

## The Auditor Often a Neglected Asset

VISITS to various properties show a great variety in the duties performed by auditors in connection with the many statistical statements compiled by them.

On some properties the auditor assumes that his work is completed when these statements are prepared according to the standard form and are submitted to the executives concerned in the minimum time after the figures are collected.

On another group of roads the auditor goes farther than this and prepares special analyses of the most significant figures, which he presents with written or verbal comments on their meaning to the executives most concerned. For this service the auditor should be well fitted. While he may not be as familiar with many of the details of operation as the head of the department to whom he submits these analyses and comments, he is usually more used to working with and comparing figures, and generally also he has a broader viewpoint of the financial status and needs of the entire property than the head of any single operating department. Hence his comparisons and conclusions ought to be of great help if offered tactfully so that he does not appear to be interfering with the direction of another department. The right kind of a department head, of course, will welcome such co-operation, because figures have value only to the extent to which they are used. If they are filed away without study, the railway might just as well save the cost of getting them up.

Still other auditors go farther, with advantage to the company. They realize that the executives to whom they submit their analyses have duties connected with the physical operation of the properties which demand a great share of their time and that the real significance disclosed by these financial analyses may be overlooked in the press of other matters—perhaps not more important but at least more immediate. In such cases the auditor can very properly bring the matter again to the attention of the executive who has power to act. He need not suggest the remedy. He need not even urge action. But at least he can take the responsibility of seeing that the matter receives consideration and is not lost in the limbo of forgotten things.

Which one of these several attitudes will be taken by the accountant will depend very largely on the manager of the property. If he indicates by his manner that he wants nothing more than statistics and financial statements, these are about all he will get. But if he does this he will fail to take advantage of what should be a great asset of the property. The auditor is not only accustomed to interpreting figures, but he is the only department head who has to keep in touch with what is going on in all departments. The wise executive will encourage him to keep up his study of the finances of the property and to submit any analyses of them which he thinks concern the economical operation of the road.

The good which an accountant can do does not end even with these services. As with the treasurer, who is the chief financial adviser of the company, his advice or that of both should be sought in the case of matters relating to financial transactions, especially those that are unusual. As an example, a certain railway some time ago leased another railway, agreeing to pay a specified sum as annual rental. But after the contract had been signed and sent to the auditor for filing he immediately saw that no provision had been made for terms of payment. Was this sum to be paid annually, quarterly or monthly, and was it to be paid at the beginning or at the end of each such period? As this part of the contract related directly to the disbursements which the auditor would have to provide for, he was impressed with the fact that this detail had not been covered. This point had not occurred to the lawyers who drew the lease.

Obviously, it seems, the broad knowledge which the auditor has of the finances of all departments of a railway should be utilized to the fullest possibilities.

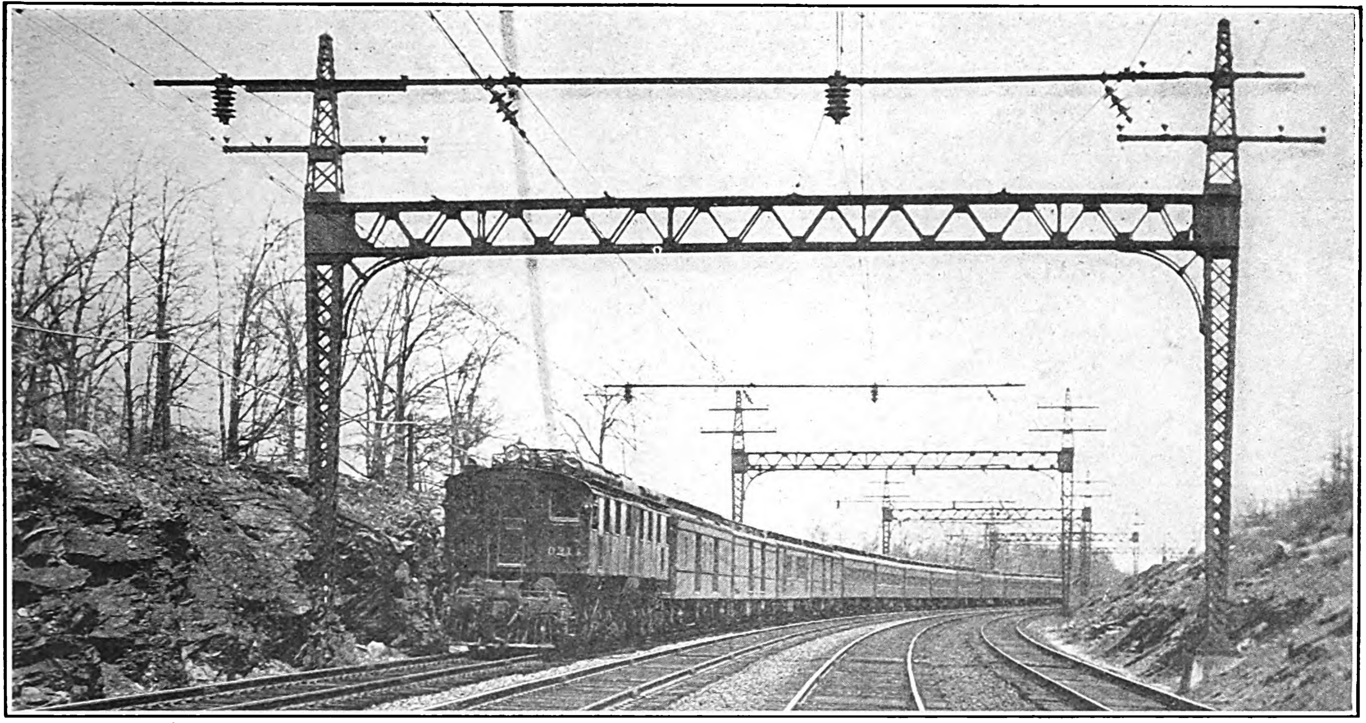
## Making the Breaks in Traffic

THE average schedule speed attained on a street railway system depends to a considerable degree upon the effort exercised by the car crews to be ready to make the breaks in traffic. There is a common tendency on the part of motormen to coast along leisurely if they see that traffic is against them at the intersection which the car is approaching. This practice is not good in two respects.

The first and minor reason is that it is annoying to the passengers who want to get off at this intersection to have the car approach their destination at so slow a pace. The more important reason is that often by the time the car reaches the intersection the whistle has blown, and then, before the passengers are off and the new ones on, the whistle has again blown and the car has to wait another change of the traffic flow. Had this car been operated at good speed and brought as quickly as possible to the stopping point, it would have had time to make its passenger interchange and been ready to proceed with the first change of traffic in its favor.

Riding on a certain car recently it was noted that the motorman lost the break in traffic in this way three times in a mile and a half, simply because his operation of the car was as though he had "all day" to get to the end of the line. Unfortunately, in the particular city in which this was observed, there is a notable absence of snap and get-up-and-go all over the railway system. Even though the equipment here is old and slow as compared with modern equipment, the trainmen are by no means getting the full speed capacity out of what they have.

Thus, the point of this comment about missing the breaks in traffic is exaggerated on the property in mind, but it is a point that could well be given attention on many systems.



The Colonial Express, a 13-Car Through Limited Train, Operated Between Boston and Washington, Runs 84 Miles on Electrified Track Between New Haven, Conn., and Manhattan Transfer, New Jersey, via the Hell Gate Bridge Route Through New York City—Newest Type Locomotive

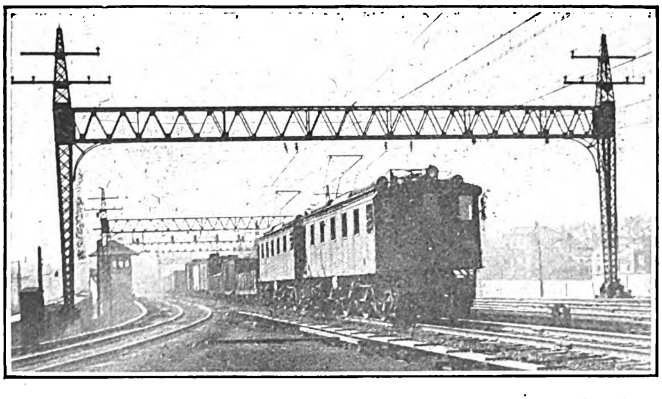
# New Haven Inaugurates 100 per Cent Electric Operation

### With the Addition of 12 Electric Locomotives and Extension to the Power Plant, the Use of Steam Engines Has Been Eliminated in the Through Electrified Service Between New York and New Haven

*By H. F. Brown*

Assistant Electrical Engineer New York, New Haven & Hartford Railroad, New Haven, Conn.

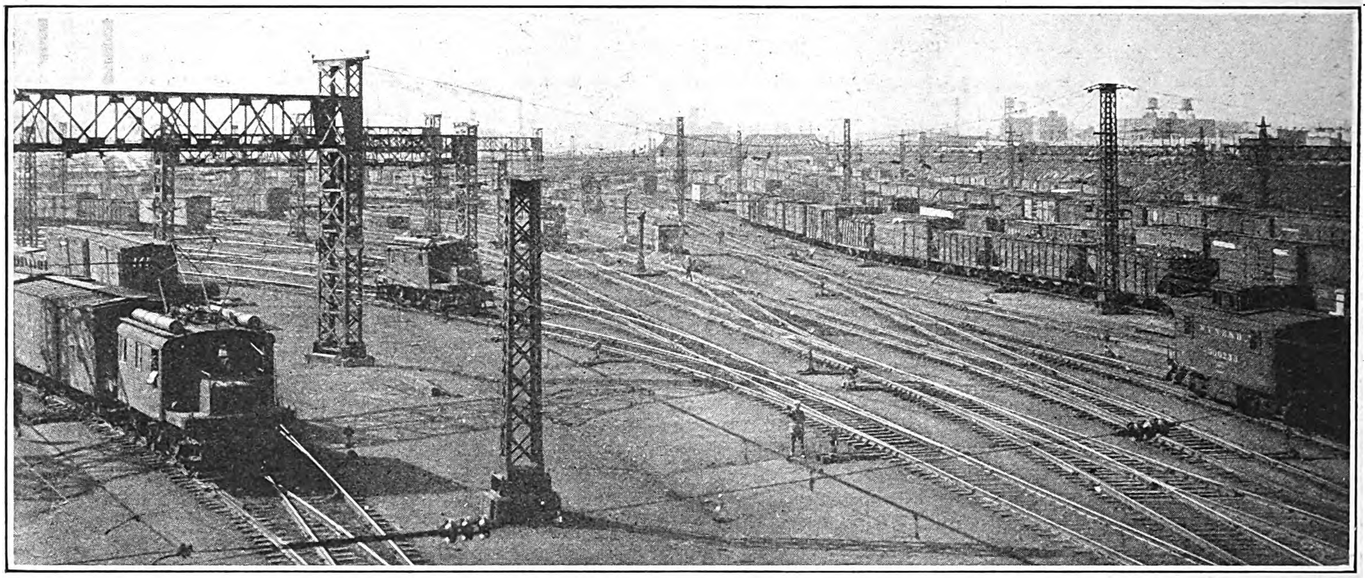
DURING the past year the New York, New Haven & Hartford Railroad has had under construction with the Baldwin Locomotive and Westinghouse Companies twelve 180-ton a.c.-d.c. electric passenger locomotives, similar in construction to the five a.c.-d.c. locomotives ordered in 1918, with the exception of a slight change in gear ratio and the length of the cab. The delivery of these locomotives commenced in November, 1923, and in April, 1924, the last one was received and placed in service between New York and New Haven. They are equipped with 12 Westinghouse 409-C-2 motors, and with the gear ratio of 25:89 have a continuous tractive effort, with forced ventilation, of 16,000 lb., with a maximum momentary tractive effort, for starting, of 47,500 lb.



The Heavy Freight Trains on the New Haven Are Hauled by Double-Headed A.-C. Locomotives

During the past year also the New Haven Railroad has been replacing one of the 3,750-kva., 11,000-volt turbo-generator units originally installed in its Cos Cob power plant with a new unit having a single-phase rating of 12,860 kva. at 70 per cent power factor, not only to increase the plant capacity but to take advantage of the better economies of larger units of latest design. This new unit was placed in daily operation during January, 1924.

Prior to the advent of these 12 new electric locomotives, it was the custom to change locomotives at Stamford for many of the through passenger trains, as well as for all the passenger trains which leave the main line at South Norwalk, Bridgeport and Devon, substituting steam locomotives for the latter trains and for many of the through trains, or straight alternating-current electric locomotives, originally purchased for freight service, on some of the through trains to New Haven during the



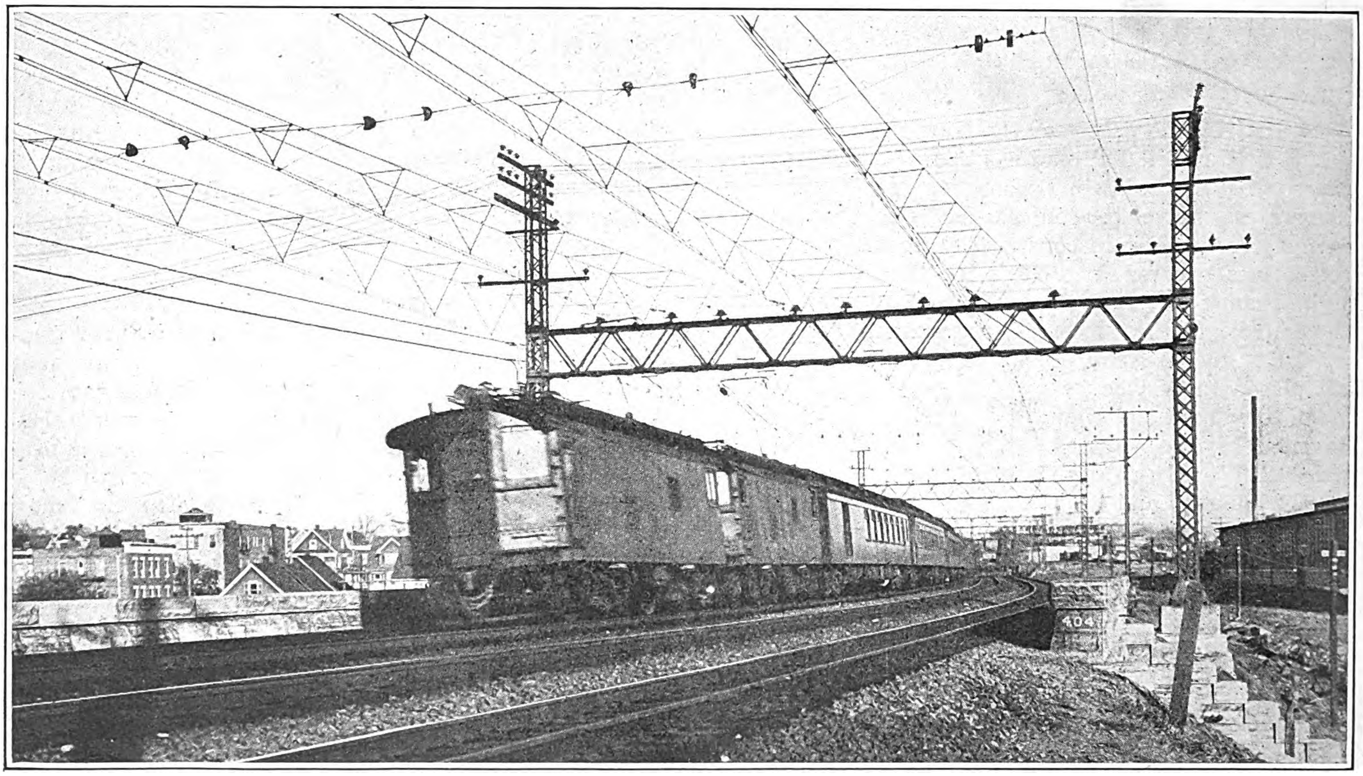
The Oak Point Yard in New York City Entirely Electrically Operated with Switching Locomotives Designed for This Service

summer months, when heating of cars is not required.

By March 1, 1924, enough of the new locomotives were in service to eliminate the necessity for changing locomotives on most of the through trains at Stamford; and by the end of April, when the summer time-table went into effect, all of the passenger trains running over the electrified zone were operated with electric locomotives. Trains which leave the main line at South Norwalk and Bridgeport now change to steam locomotives at these points.

With the new time-table, all the Hell Gate Bridge trains operating into the Pennsylvania Station, New York, have also been electrified and are now operated by the straight alternating-current locomotives, or by the 180-ton a.c.-d.c. type, changing power, as formerly, at Harold Avenue, Long Island City, from which point these trains are operated by the Pennsylvania direct-current electric locomotives. The popular "Colonial" and "Federal" express trains, which have been operated for many years as through trains between Boston and Washington, formerly being ferried from the Harlem River around New York into Jersey City, are thus now hauled electrically from New Haven into Manhattan Transfer, Newark, N. J., a distance of 84 miles.

Due to displacing the alternating-current electric freight locomotives from the passenger service east of Stamford, it was possible, about March 1 of this year, to inaugurate electric operation of all through freight trains between Harlem River, Oak Point, and Cedar Hill, New Haven, terminals. During March 150,052,075 ton-miles, trailing load, of freight were handled electrically, the average daily mileage for all locomo-



Electric Passenger Express Train on the New Haven, Showing Original Catenary Overhead and Original Type of Locomotive tives assigned to freight service, including those in the shop, being 117.49, and for serviceable locomotives more than 170 miles.

In order to speed up the movement of freight the greater number of the trains are dispatched from the terminals as soon as enough cars are ready to make up a trainload suitable for a single locomotive unit, although some of the heavy "drags" of approximately 4,000 tons (80 to 100 cars) are handled at lower speeds with two units operated in multiple.

Some additional facilities have been required for this all-electric service, notably an enlarged steam locomotive terminal at South Norwalk; electrification of several hundred feet of a branch line at Bridgeport, used for power interchange and for picking up and dropping off cars at this point, and an additional electric locomotive storage track with inspection pit and pantograph inspection platform at the New Haven terminal.

In addition to the new locomotives, five new train-heating units or tenders have been purchased, three of which have been in service since April. These contain oil flash boilers and tanks for the fuel oil and water necessary for train heating, and are primarily intended for use with the straight alternating-current locomotives, which have no train-heating equipment, when these are used in passenger and express service on the Hell Gate Bridge trains.

### THE ORIGINAL ELECTRIC LOCOMOTIVES HAVE AVERAGED 250 MILES PER DAY

It is expected that one of the economies of this all-electric operation will result in time from the reduction of the serious corrosion of the overhead structures and in reduced insulator maintenance. Continued steam operation, with its attendant smoke and gases, has been largely responsible for the difficulties experienced in this connection. The new locomotives will also allow a large margin in the operation of the original 41 electric passenger locomotives, some of which have made more than a million miles since their purchase in 1906. This is shown by the passenger locomotive-miles per day, which averaged 171 in March, 1924, against 220.5 for March, 1923. These have averaged in the past as high as 250 miles per day.

There remains one section of the electric zone—that between New Haven and Bridgeport, over which some steam operation will have to be continued on account of its being part of the route of the heavy freight traffic between Cedar Hill and Maybrook (the Poughkeepsie Bridge Route) as well as part of the route of the New York-Waterbury-Winsted passenger trains which change power at Bridgeport. All of these trains leave the main line at Devon.

The New Haven now has operating in heavy electric traction service 118 single-phase a.c. electric locomotives of the following types:

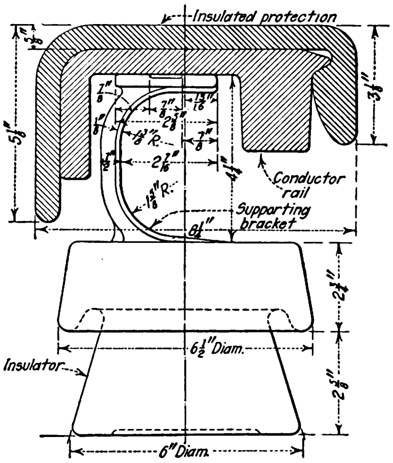
| | |
|---|---|
| 41 | 110-ton a.c.-d.c. for passenger service. |
| 6 | 120-ton a.c.-d.c. for passenger service. |
| 17 | 180-ton a.c.-d.c. for passenger service. |
| 36 | 120-ton a.c. for freight service. |
| 1 | 135-ton a.c. for freight service. |
| 1 | 140-ton a.c. for freight service. |
| 16 | 80-ton a.c. for switching service. |

In addition to the above locomotives, there are 29 a.c.-d.c. and eight a.c. motor cars, together with 68 trailers, all with multiple-unit control.

Thus, with its electric operation of heavy through passenger and freight service, yard switching, and electric suburban motor car trains, the New Haven electrification comprises the entire field of heavy electric traction, in a magnitude not equaled by any other railroad.

## Under-Contact Conductor Rail

A PROTECTED conductor rail and support, which comply with conditions governing the clearances in force on British railways, have been developed in London following a careful study of the successful experience with under-contact conductor rails in the United States and the Argentine. It is designed to give efficient protection to the third rail at 1,500 volts. A C-shaped bracket, mounted in an insulator, supports the U-shaped conductor rail, over which is hung the insulation in the form of an inverted trough. The rail section used, which is of a peculiar shape, as shown in the drawing, has an approximate weight of 100 lb. per yard. Its composition is based on experience gained in the production of under-contact conductor rails at present in use. The contact surface of the section allows for a considerable amount of wear. The rail is so balanced that it is simply laid on the insulated C brackets and maintains itself in position by its own weight, the center of gravity being below the point of support. In joining the rail sections, single fish plates are used, held with $\frac{7}{8}$-in. countersunk bolts.



Conductor Rail Is Mounted on "C" Insulated Brackets. Insulation Is Laid on Conductor Rail and Is Held in Position by Lip

The protective covering, of molded composition, affords adequate insulation, is non-inflammable, durable, and is said to be free from warping. This is applied in 6-ft. lengths, permitting standard straight sections to be used on most curves. The protective covering is simply slipped over the rail and is self-locking when once in position, as each length laps over the adjacent length, with the length over the incline bolted to the conductor rail.

The current-collector gear is of parallelogram construction, and may be used on either over-contact or under-contact rail, without adjustment. To keep the tension on the rail the same for both, the under-contact rail is mounted several inches lower than the over-contact rail. The shoe is of cast iron, chamfered at both ends. A thin elbow permits the shoe to break off if it meets an obstruction without further damage to the rail or shoe gear.

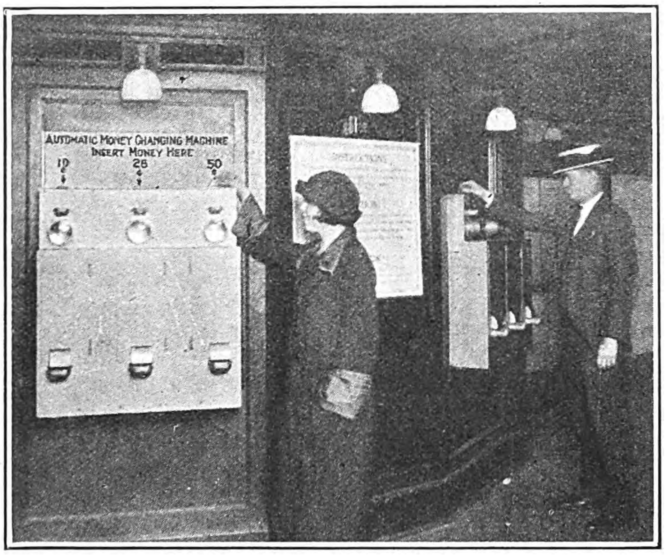
Tests conducted on the London, Midland & Scottish Railway have resulted in the successful collection of current at 1,200 volts and a speed of 70 m.p.h. Tests were made to determine the efficiency of the covering. Some of these were carried out dry, and others after soaking the protective covering in a solution of salt water. In neither case was any deflection obtained on a milli-ammeter, with the rail connected up to the 1,200-volt circuit.

# Interborough Tries Change-Making Machines

### The Action of the Machine Is Automatic, an Electric Contact Device Controlling the Release of the Necessary Change When a Coin Is Inserted

MACHINES for automatically changing dimes, quarters and half dollars have been installed for trial in the northbound Seventy-seventh Street station of the Lexington Avenue subway, operated by the Interborough Rapid Transit Company, New York. The machine was developed by Frank Hedley, president and general manager, and J. S. Doyle, assistant general manager. The present installation consists of two units, which have been installed in the panels of the change-making booth at the Seventy-seventh Street station. The machines are approximately 30 in. square and the coin to be changed is inserted through slots at the top. A sign over the machine reads "Automatic Money Changing Machine—Insert Money Here" and arrows point to the slots for the reception of the coins.

When a coin is inserted it drops upon two contact points in the change-making machine and establishes an electric circuit to release the necessary change. The coin is held in position back of a magnifying lens, so that it can readily be seen by the person who inserts the coin. Similar lenses on the back of the machine inside the booth also provide for an operator's inspection. A switch is provided in the operator's booth so that he can open the circuit and thus automatically prevent the issuing of change, should it be necessary to retain a coin for inspection. Inserting a second coin in the slot releases the one in view and the second coin takes its position upon the inspection contact.



Automatic Change-Making Machines in Seventy-seventh Street Station of Interborough Rapid Transit Subway, New York

Should a coin of other denomination than that indicated be inserted in the slot, it drops into a receptacle immediately over the magnifying lens so that it can be returned. Change for the money inserted comes out in receptacles at the bottom of the machine.

In the present installation doors are provided on the front side for filling the machines with change and for taking out money which has passed through the machine. When the machines are extended to use in other stations, however, it is the intention to provide doors only on the inside of the change booth. It may also be necessary to make the machines up in individual units, one for dimes, one for quarters and a third for half dollars.

While the present installation is entirely in the nature of a trial, it is the intention of the officials to extend the use of these change-making machines to other stations on the system as soon as they are satisfied with its working. At congested points, like Times Square, it may be desirable to install these at frequent and convenient locations and have an attendant to oversee their operation and fill the machines with change as is required. Where there are separate stations on opposite sides of the tracks a single attendant on the traffic side should be able to take care of the change-making machines at both locations. This also applies to stations which have more than one entrance. In this latter case one attendant could take care of several machines, which would be installed at the most convenient points where passengers pass through turnstiles.

Statistics collected by the Interborough Rapid Transit Company indicate that approximately 50 per cent of the change issued at subway stations is for dimes, so at heavy traffic centers it may be necessary to have a larger number of machines for changing dimes than for the other denominations. The mounting of individual units would also be of assistance in taking care of maintenance, as a single machine could be removed and replaced by another without interruption to service and without interfering with adjacent machines.

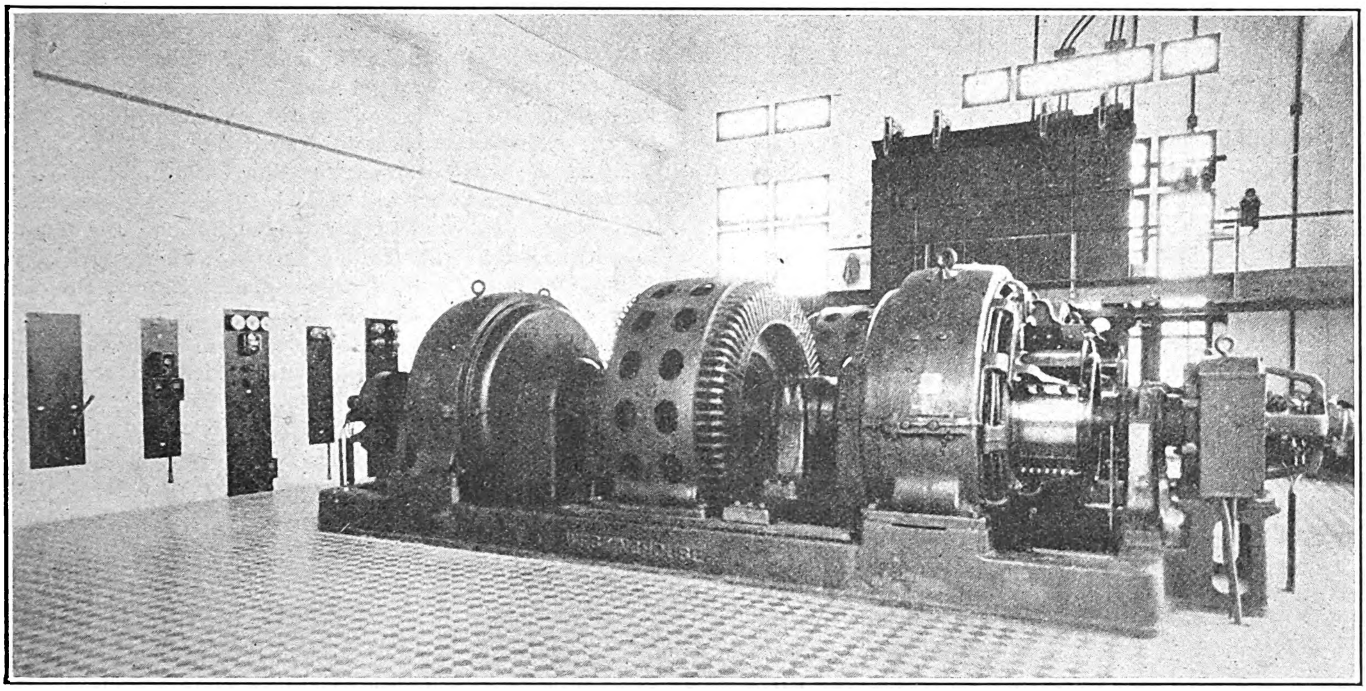
The three-unit machines at present being tried provide for change up to approximately $175. Another interesting point in the statistics gathered is that at present approximately 5 per cent of the riders ask for change at fare booths, the remaining 95 per cent obtaining their change at other points.

After the installation of the machines, the company expects to keep accurate records regarding the amount of money changed and the various denominations to serve as a guide in determining the best size for the machines and the number of individual units needed.

# Encouraging Trainmen to Tell the Truth About Accidents

AN UNREMITTING safety campaign without any intensive drive or spasmodic effort on the Middlesex & Boston Street Railway reduced the number of accidents from 147 in January, 1923, to only fifty-eight in January, 1924. Carefully formulated rules for the operation of cars and strict enforcement all the time are thought by the company to have been responsible for this improvement. Although the reduction is perhaps partly explained by better street conditions, the number of automobile collisions decreasing from seventy-seven to fifteen, the general improvement also was quite noticeable.

It is the custom of this railway to take no disciplinary action against a motorman after an accident provided he tells the entire truth concerning it. On the other hand if he is detected in any false statements concerning the circumstances of the accident he is invariably discharged. No excuses whatever are accepted for a car collision. The rule provides that no car under power shall follow another closer than 500 ft. and shall never approach closer than two car lengths. Enforcement of this rule has resulted in almost complete elimination of car collisions.



Interior of Quilicura Substation, Showing One of the 2,000-Kw. Motor-Generator Sets and Switchboards

# Power Distribution System of Chilean State Railways Electrification

### Five Stations, Each with Two 2,000-Kw. Motor-Generators, Supply 3,000-Volt D. C. for Operating This Electrified Railroad—A Special Method of Integrating Power Demand Is Used in Connection with Bills of the Power Company Supplying the Railway

*By D. C. Hershberger*
General Engineer Westinghouse Electric & Manufacturing Company

RELIABILITY of operation has been the main objective of the designers of the power equipment for the electrification of the Chilean State Railways between the seaport of Valparaiso and Santiago, the capital and metropolis of Chile, 116 miles distant. The contact line is supplied with direct current at 3,000 volts from alternating-current power stations, making a.c.-d.c. substations an essential link in the power supply system.

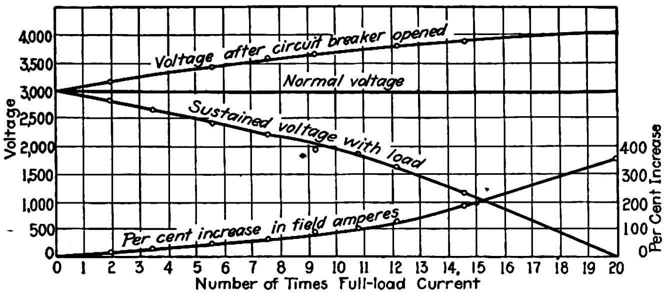
This first zone of the electrification, now in full operation, is equipped with five modern synchronous motor-generator substations which include design features that have proved most effective in transcontinental service in the United States.

Part of the electrified zone between Valparaiso and Los Andes forms a link in the only transcontinental line in operation across South America. This route has one terminal at Valparaiso on the Pacific Ocean and the other at Buenos Aires, Argentina, on the Atlantic. The first zone to be electrified comprises approximately 10 per cent of the entire route mileage of the Chilean State Railways broad-gage lines.

Transportation conditions are especially severe in this district, owing to the mountain range between Santiago and the coast. The maximum grades are 2¼ per cent and the shortest curves 10 deg., both of which conditions made steam operation very difficult; in fact, the limit of capacity with steam had virtually been reached. With electric motive power the track capacity has been increased enormously, putting off for many years the construction of second tracks, as the track capacity with electric operation is more than three times as great as before, and it is susceptible of still further increase by the use of heavier motive power units, and a corresponding increase in the size of substations and overhead distribution system.

## ENERGY IS SUPPLIED BY A PRIVATE COMPANY

Although the Chilean government had control of sufficient water power sites that it could have constructed its own generating stations and transmission system, it was decided to purchase energy, thus simplifying the operation and reducing the necessary capital for the electrification of the first section. It also makes possible a greater diversification of load, especially as other customers are supplied from the same transmission lines. Accordingly arrangements were made with the Compania Chilena de Electricidad, Limitada, for the supply of the necessary energy. This company has recently completed a 25,000-kva. hydro-electric generating station at Maitenes, 37 miles south-east of Santiago. Power is supplied from this station, the 15,000-kva. Florida hydro-electric station and the 20,000-kva. Mapocho steam station, which also furnish



**Direct-Current Terminal Voltage Characteristics of the 2,000-Kw. Motor-Generator**

power to Santiago and more recently to Valparaiso, Los Andes and intermediate cities.

The railroad owns the substations for converting the railway power in the first electrified zone, while the power company owns the transmission lines. Since other customers are served by the same transmission system the energy for the railway is metered separately at each railway substation. This is done on the low-tension side of the transformers supplying the motor-generator sets, a nominal amount being added to the meter readings to compensate for transformer losses.

In general the railroad has preference over other customers in obtaining power for the operation of trains, shops, engine houses and for station lighting, except under certain conditions where this preference would not be exercised by the railroad to the detriment of the general public.

The energy is billed to the railway on two separate bases—maximum demand and kilowatt-hour consumption. The maximum demand is controlled by a power indicating and limiting system that will prevent the total combined demand of the five substations from exceeding a predetermined limit. A minimum annual kilowatt-hour consumption clause also is included in the contract.

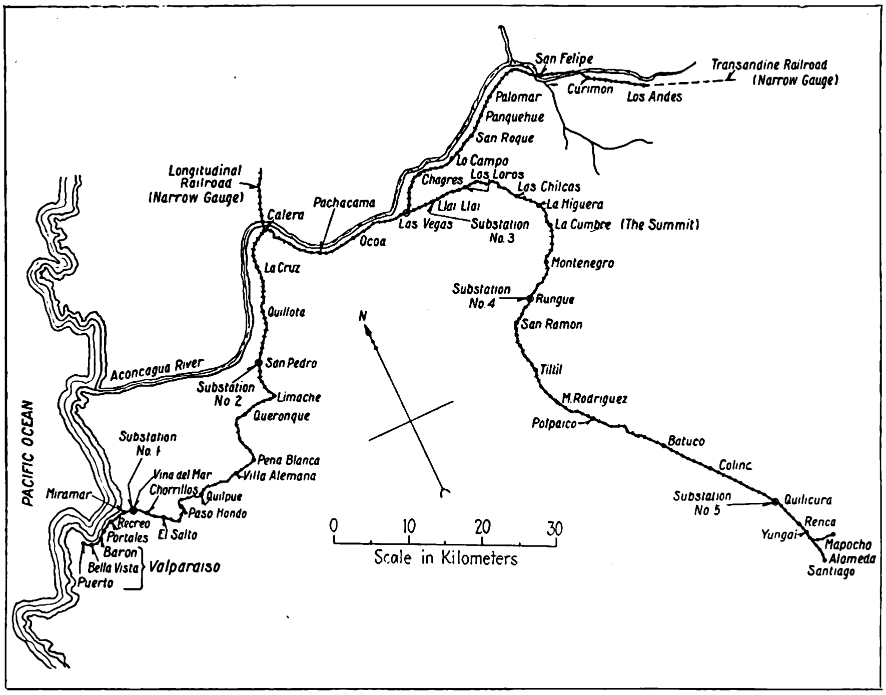
Power is transmitted three-phase at 50 cycles. From the Maitenes generating station through the San Cristobal receiving station at Santiago to Valparaiso, approximately 125 miles, there is a duplicate 110,000-volt transmission line. The San Cristobal station and the railway substations also may receive power in emergencies from the Santiago city system, which is fed by the Florida and Mapocho stations.

From the San Cristobal receiving station a twin-circuit three-phase, 12,000-volt line supplies the Quilicura (No. 5) substation. At Las Vegas the power company has installed a transformer station which steps down from 110,000 to 44,000 volts for distribution to the railway substations at San Pedro, Llai Llai, and Rungue (Nos. 2, 3 and 4) by means of separate duplicate lines to each station. These lines are also used for supplying other power customers. At Miraflores, near Valparaiso, another transformation down to 12,000 volts is made for the line supplying Vina del Mar substation (No. 1) and the city of Valparaiso. All of these lines have been duplicated so as to permit repairs to be made without shutting down the stations, and also giving a greater factor of reliability.

### ENERGY IS TRANSFORMED IN FIVE 4,000-KW. SUBSTATIONS

Energy for railway operation is converted from high-tension alternating current to 3,000-volt direct current in five 4,000-kw. substations, each of which is equipped with two 2,000-kw. synchronous motor-generator sets.

The substation buildings are of reinforced concrete with reinforced concrete roofs. Windows on all sides provide natural lighting in the machine and transformer rooms. The blowers for the motor-generator sets, the starting and running circuit breakers, station service transformers and breakers and the flash suppressors are located in the basement. Space also is provided beneath the transformers for oil tanks in which to store the oil when it is drawn off from the transformer cases. The machine rooms of all the stations are identical, and have been designed to accommodate a third motor-generator set, which will be installed when it is necessary to provide for increased traffic. A traveling crane for handling the motor-generator and switch-gear parts spans the room.


San Felipe
Transandine Railroad (Narrow Gauge)
Curimon
Los Andes
Palomar
Panquehue
San Roque
Lo Campo
Chagres
Los Loros
Las Chilcas
La Higuera
Llai Llai
Las Vegas
Substation No. 3
La Cumbre (The Summit)
Longitudinal Railroad (Narrow Gauge)
Calera
Pachacama
Ocoa
La Cruz
Montenegro
Substation No 4
Rungue
San Ramon
Quillota
N
San Pedro
Tiltil
Aconcagua River
Substation No 2
Limache
Queronque
M.Rodriguez
Polpaico
Batuco
Colina
PACIFIC OCEAN
Substation No 1
Pena Blanca
Villa Alemana
Vina del Mar
Chorrillos
Miramar
Quilpue
Paso Hondo
Recreo
Portales
El Salto
Baron
Bella Vista
Puerto
Valparaiso
0 10 20 30
Scale in Kilometers
Substation No 5
Quilicura
Renca
Yungai
Mapocho
Alameda
Santiago

**Map of First Electrified Zone of the Chilean State Railways, Showing the Route and Locations of Substations**

The transformers are housed in a separate room, which is of the same general design as the machine room but is narrower and does not have a traveling crane. The roof trusses of the transformer room, however, are designed with sufficient strength to support chain blocks over the transformers for raising the cores out of the cases, after which the cases may be rolled to one side and the cores lowered to the transformer foundations.

Each motor-generator set is driven by a 2,840-hp., three-phase, 2,300-volt, 50-cycle, 500-r.p.m. synchronous motor on the same shaft with two 1,000-kw., 1,500-volt direct-current generators, one on either side of the motor, and connected in series for 3,000 volts. These machines are shunt-wound compensated generators, with commutating poles. The sets include two exciters, one of which supplies current for the synchronous motor field and the other for the generator fields.

The motor-generator sets are reversible, being able to receive direct current from the contact line when the locomotives are regenerating and convert it to alternating current, which is fed back into the alternating-current transmission line for use elsewhere.

The sets were designed to give successful performance under a wide range of loads, and to withstand severe short circuits on the distribution system. They are rated at 2,000 kw. continuously, followed by 3,000 kw. for two hours without exceeding a temperature rise of 55 deg. C., and can have this followed with 6,000 kw. or 200 per cent overload for 5 minutes without exceeding a safe temperature.

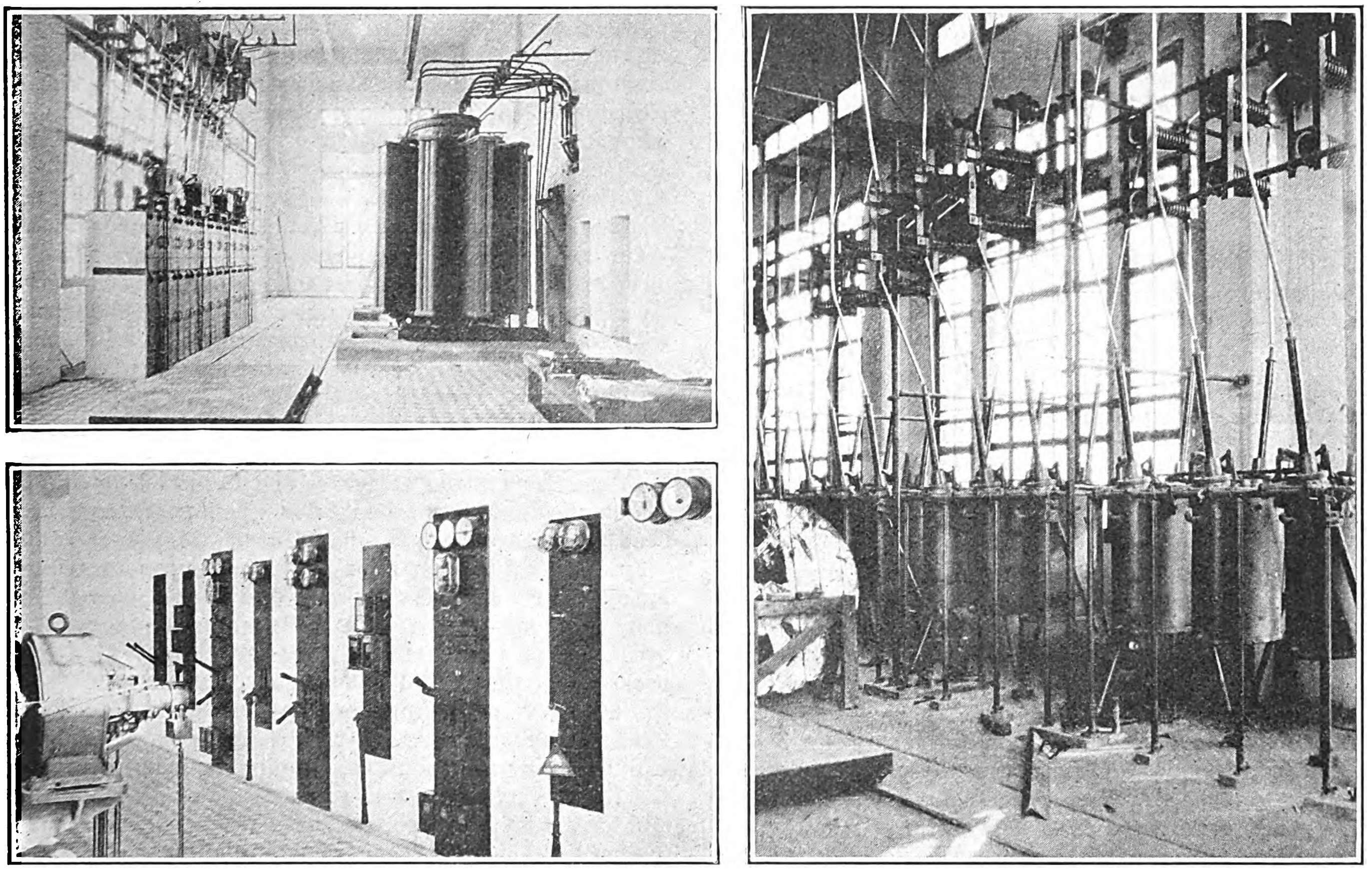
The synchronous motors have sufficient capacity that fans are not required, and the fields are of such size that high power factors can be obtained over a wide range of loads. The exciter windings are arranged to give the desired power factor when the machines are operating either as motors or as generators.

The generators are partially inclosed to minimize windage loss and are provided with a separate blower that operates only after a definite temperature of the windings has been reached. The blower is started automatically by means of a resistance coil taped up with a series conductor in such a manner that it maintains approximately the same temperature as the armature. Thus by shutting down the blower on light loads the over-all efficiency of the set is increased.

Since good commutation is essential for high-tension direct-current machinery under the severe conditions of heavy sustained overload occurring in normal operation, every precaution has been taken to assist in obtaining it. One of the important features is the use of compensated windings, distributed across the faces of the main poles.

The voltage characteristics of the generator sets, as determined by oscillograph tests, is shown in one of the accompanying diagrams. Each point on the curve represents a short-circuit test made with one side of the line grounded and the other opened by a low-speed circuit breaker.

Another diagram shows an oscillograph record of a short circuit on the machines. In the test the generators were short-circuited at 3,000 volts with no external resistance other than the necessary cable conductors and circuit breaker. In this test the current reached 13,000 amp., or 20 times full load current.

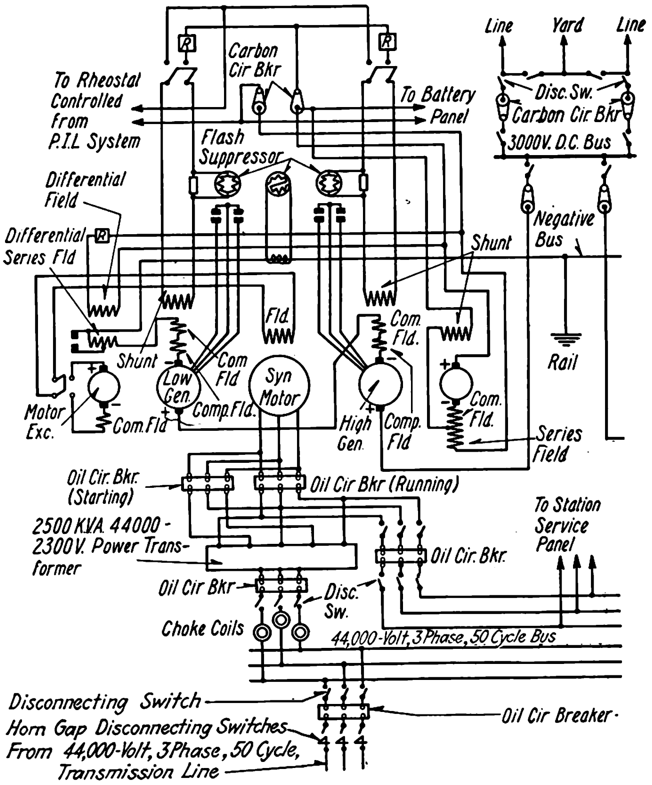


**Some of the High-Tension Substation Apparatus**

Above—The main transformers and the 12,000-volt breakers installed in the high-tension room at Quilicura substation.
Below—The 44,000-volt circuit breakers at Llai Llai substation.

At Right—The panels controlling the transformers, synchronous motors, incoming lines and flash suppressor are mounted in the dividing wall between machine and transformer rooms.

Previous experience with this type of equipment showed that it was unnecessary to use extensive flash-guard equipment as a precaution against flashovers. Their omission gives greater accessibility to the commutators. Flash suppressors have improved conditions so remarkably as to make their use very desirable, despite the unusually stable operation of these generators under short circuits. They add reliability to the system as a whole, in that short-circuit currents are not permitted to rise to high values, endangering the condition of the circuit as a whole, including armatures and electrical equipment. The flash suppressor adopted consists of a group of light knife switches mounted on a shaft to which is attached a strong spring held in tension. When the tripping mechanism is operated the switches close at high speed, short-circuiting the generator armature windings on the rear end through three collector rings to which taps are brought out through the armature windings. Trip coils


Carbon Cir Bkr
To Rheostat Controlled From P.I.L System
To Battery Panel
Flash Suppressor
Differential Field
Differential Series Fld
Line
Yard
Line
Disc. Sw.
Carbon Cir. Bkr
3000V. D.C. Bus
Negative Bus
Shunt
Fld.
Com. Fld.
Rail
Shunt
Com Fld
Low Gen.
Syn Motor
Comp. Fld.
Motor Exc.
Com. Fld
High Gen
Comp. Fld
Com. Fld.
Series Field
Oil Cir. Bkr. (Starting)
Oil Cir Bkr (Running)
To Station Service Panel
2500 KVA 44000-2300V. Power Transformer
Oil Cir. Bkr.
Oil Cir Bkr
Disc. Sw.
Choke Coils
44,000-Volt, 3 Phase, 50 Cycle Bus
Disconnecting Switch
Horn Gap Disconnecting Switches
From 44,000-Volt, 3 Phase, 50 Cycle, Transmission Line
Oil Cir Breaker

**Schematic Diagram of Connections of One of the Substations, Showing One Incoming Line and One of the Motor-Generator Sets. The Other Set Is Connected in Exactly the Same Manner**

energized from the secondaries of through-type transformers operate the tripping mechanism. The transformers in turn are energized by the current rise in the main generator circuit.

### THREE-PHASE TRANSFORMERS ARE USED

Each station contains two three-phase, 50-cycle transformers. Two of the stations receive power at 12,000 volts and the other three at 44,000 volts, making necessary the use of main transformers of different voltage in the two groups of substations. All the transformers are rated at 2,500 kva. continuous, followed by 150 per cent load for two hours with a 60-deg. C. rise. Following this load the transformers are capable of withstanding 300 per cent load for 5 minutes.

These transformers all deliver 2,300 volts on the low-tension side, with starting taps giving less than half this voltage. Normal voltage may be delivered to the low-tension side when the transmission line voltage is 10 per cent below normal through a second set of taps on the primary. All the transformers have star-connected primaries and delta-connected secondaries.

The transformers are of the oil-insulated, self-cooling radiator type designed for indoor service. The scarcity of cooling water made this type preferable to the water-cooled type.

Since the railroad has a number of tunnels in the electrified zone with low clearances, it was found desirable to strip the tanks clear for shipment, with the radiators boxed separately.

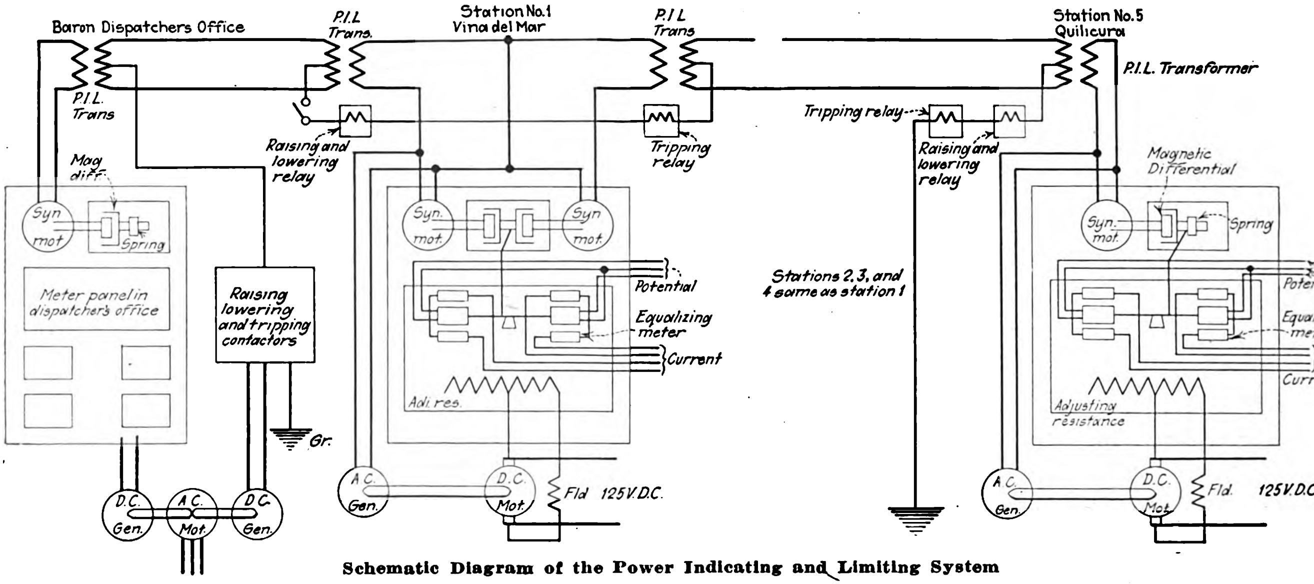
In order to limit the stresses due to short circuits on both the low-tension and the high-tension sides, the arrangement of the transmission system and the transformer stations is such as to introduce a considerable amount of impedance in the circuit, limiting the stresses to conservative values.

Oil storage facilities have been provided by the construction of tanks located underneath the transformers. When making repairs the oil is first drawn off into the storage tank, this arrangement also facilitating the oil filtering. The transformers have been equipped with wheels and a foundation containing tracks, so that the transformer can be rolled out onto a truck. This can be moved the entire length of the high-tension room and outside the building, where tracks are laid.

Horn-gap switches mounted on poles outside the buildings for cutting off power and for isolating one of the duplicate transmission lines when necessary have been provided at all the substations.

In the high-tension room the circuits are controlled by oil circuit breakers between the horn-gap switches and the high-tension bus. Westinghouse type G-1 breakers are used in the 44,000-volt stations and E-6 breakers in the 12,000-volt stations. Similar breakers are used for controlling the transformers on the high-tension side. The 44,000-volt disconnecting switches and breakers are mounted on pipe framework, while the 12,000-volt breakers are arranged for cell mounting and have removable doors. These breakers have remote mechanical control and automatic tripping mechanism.

Feeder switches for sectionalizing the lines at the substations are mounted on each substation roof. These are 2,000-amp., 3,000-volt switches equipped with horns.


Baron Dispatchers Office
P.I.L Trans.
Station No.1 Vina del Mar
P.I.L Trans
Station No.5 Quilicura
P.I.L. Transformer
P.I.L. Trans
Mag diff.
Syn mot
Spring
Meter panel in dispatcher's office
Raising and lowering relay
Raising lowering and tripping contactors
Gr.
D.C. Gen.
A.C. Mot.
D.C. Gen.
Syn. mot.
Syn mot.
Tripping relay
Potential
Equalizing meter
Current
Adj. res.
A.C. Gen.
D.C. Mot.
Fld 125V.D.C.
Stations 2, 3, and 4 same as station 1
Tripping relay
Raising and lowering relay
Magnetic Differential
Spring
Syn. mot.
Potential
Equalizing meter
Current
Adjusting resistance
A.C. Gen.
D.C. Mot.
Fld. 125V.D.C.

**Schematic Diagram of the Power Indicating and Limiting System**

They are capable, if necessary, of rupturing the 3,000-volt circuit without the aid of other circuit breakers.

At substations Nos. 2 to 5 four of these horn-gap switches are installed, while at substation No. 1 (Vina del Mar) nine switches were required to sectionalize the distribution system properly. Stations 2 to 5 are located along single track, while No. 1 is located along double track. The horn-gap switches facilitate train movement in case of emergency due to failure of the overhead construction between substations, as the defective section can be isolated and trains from the opposing direction set in on side tracks energized from the section which is in good operating condition. The yard overhead construction is insulated from the main line and is fed, in the case of stations located on single track, from either feeder breaker. This arrangement permits the passage of the maintenance equipment without delay. On the double-track sections the yard can be fed from any feeder.

In the case of trouble within the substation buildings affecting the 3,000-volt cables, these switches can be used to cut off the power entirely from the building, and the contact line can be fed past the substation without the current entering the building. The arrangements at the Vina del Mar station are shown in one of the accompanying diagrams. The operating levers are located back of the main switchboard, and are connected to the switches by vertical rods passing through the roof.

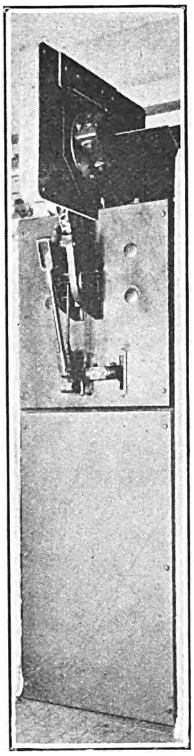
Lightning conditions in the Valparaiso-Santiago district are not at all severe, but the occasional discharges between clouds and earth are cared for by the installation of type AL aluminum lightning arresters with impulse gaps in both the 44,000-volt and 12,000-volt stations. The arresters are located in the high-tension room near the circuit breakers and tap onto the high-tension busbars.

### CONTROL EQUIPMENT FOR THE SETS AND STATION SERVICE

The starting and running breakers for the 2,840-hp. synchronous motors are in the basement under the machine room. They are controlled from the motor panel directly above, and are mounted in the dividing wall between the machine room and the transformer room. In the illustration of the switchboard, the first panel at the right is for the control of the transformer breakers, the second is for the control of one of the synchronous motors and the third for one of the incoming high-tension lines. The fourth panel controls the 2,300-volt breakers in the circuit for station service. The last panel on the left carries the handles for resetting the flash suppressors.

The station is supplied with low-tension current through a 37½-kva., 2,300 to 220-volt, three-phase transformer, which receives power from the secondaries of either of the two main transformers. This 220-volt power is controlled through a panel in the switchboard under the balcony, which contains the three-pole knife switches for the station service, comprising blower motors for ventilating the main motor-generator sets, station lighting, compressors for blowing out equipment, oil testing, filtering and drying equipment, and for the power indicating and limiting equipment of the motor-generators.

The main switchboard for the generators and outgoing d.c. feeders is divided into two sections, that for the instruments and generator control being on the main floor at one end of the machine room, while the section containing the circuit breakers and disconnecting switches for control of the 3,000-volt circuits is on the balcony directly above the control and instrument section.



Panel and 3,000-Volt D.C. Circuit Breaker Located on Balcony

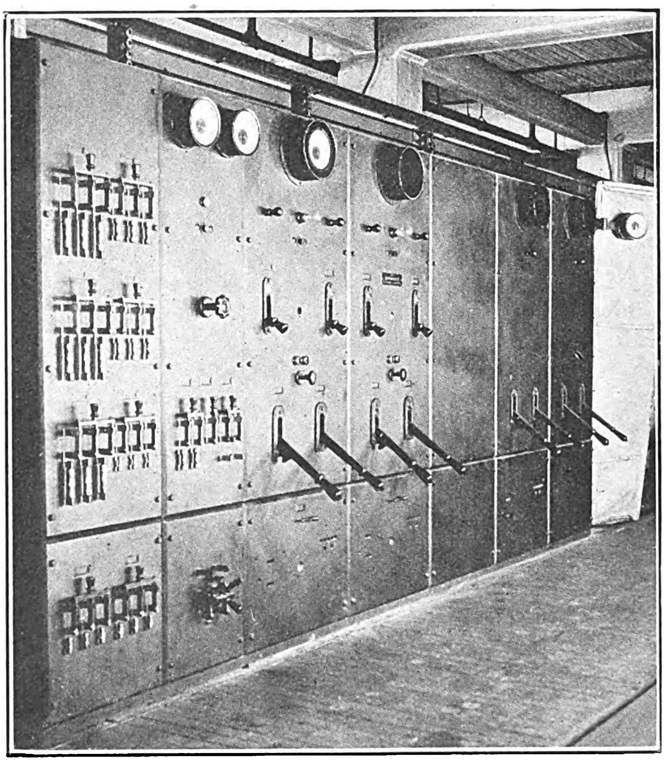
The breakers and switches are so placed that failure of any part of the high-tension circuit would cause minimum damage, the circuit breakers being mounted on the front balcony panels and the disconnecting switches on the rear panels and separated from the breaker panels by barriers. Breakers and disconnecting switches are arranged for mechanical operation from the control board. The meters are mounted on a Bakelite disk within a Bakelite case with a plateglass front, affording a clear view of the indicating dials with safety.

The generator panels carry the control handles for the main and exciter circuits, including field rheostats for the main generators and their exciters.

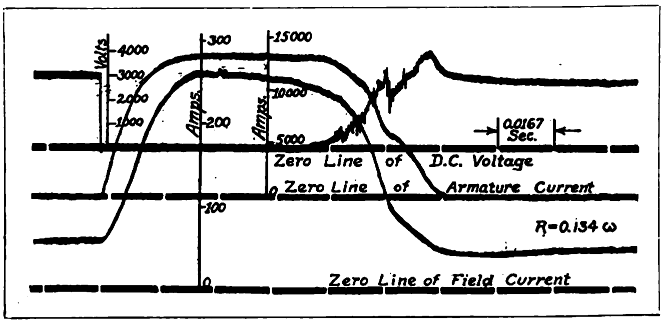
The feeder panels in stations Nos. 2 to 5 control the feeder breakers and disconnecting switches inside the building, while provision for additional protection and flexibility is obtained by placing yard feeder switches on the substation roof. Substation No. 1 has four feeder panels because of the double track.

All the generator and feeder circuit breakers are provided with unusually powerful magnetic blowouts and large arc chutes, although the duty of these breakers under short-circuit conditions is made easier by the flash suppressors.

The generator negative leads pass through transformers and tap onto a negative bus attached to the



The Control and Instrument Sections of the Main Switchboard



Oscillogram of Short-Circuit Tests at 3,000 Volts. The Current Reached 20 Times Normal Without Bucking Over

track rails. The secondaries of these transformers are connected to the trip coils of the flash suppressors, which act upon sudden increase of current due to short circuits or grounds on the d.c. system. These flash suppressors are located in the basement. They are reset from a panel in the wall between the machine and transformer rooms. When the flash suppressor is reset the generator field switch closes automatically.

Lightning protection on the d.c. system is provided by a Westinghouse type A electrolytic arrester in the feeders at each station. These are the only arresters on the 3,000-volt system.

The control system for operation of relays, circuit-breaker trips, indicating lamps, klaxons, etc., is 32 volts d.c., supplied by a storage battery. An automatic two-pole double-throw switch connects the station emergency lamps to the battery in case of failure of power on the station service board.

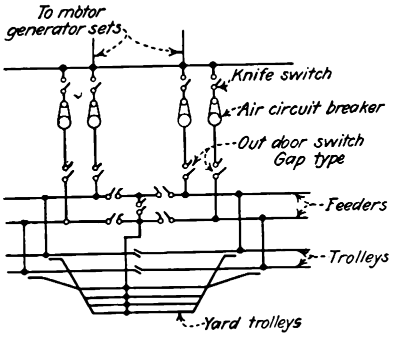
Each station contains a National Brake & Electric portable compressor driven by a 220-volt, three-phase motor for blowing out the machine windings and for other purposes. This has a capacity of 16½ cu.ft. per minute.

A 3-kva., 30,000-volt induction-regulator type oil-testing unit takes power from the station service panel at 220 volts. To provide for drying out the main transformers after installation or repair a special transformer drying outfit was designed. It consists of a bank of grids receiving 220-volt, three-phase power for heating air that is forced through the transformer being dried out by a motor-driven blower.

The oil in the breaker tanks may be reconditioned to regain its insulating properties by means of a Westinghouse type A-30 drying oven.

### THE POWER INDICATING AND LIMITING SYSTEM IS UNIQUE

Due to the type of hydro system employed, it is impracticable to provide storage capacity near the Maitenes or the Florida generating station. The power contract is based on energy used in kilowatt-hours, and also on the maximum demand in kilowatts. The maximum demand is defined as the highest reading during any 15 consecutive minutes. Although the contract does not set a limit to the power that may be taken by the railroad, a special power indicating and limiting system has been designed and installed for lowering the demand by reducing the trolley voltage at the peak.



Yard Feeder Switch Arrangements on Double Track

The long duration of the peak period specified is favorable to the railroad, in that there is little danger of serious penalization of schedules due to the operation of this device. Its greatest use probably will be that of totalizing the power taken by all five substations and indicating it in the dispatcher's office at Baron. The permanent chart drawn by graphic meters serves to determine the maximum demand factor for calculating this portion of the bill.

For the contemplated service it is interesting to note that calculations have indicated the following demand figures, the load factors being based on a calculated average load for the system of 4,800 kw.:

| Length of Maximum Demand Period, Minutes | Calculated Maximum Demand for Period, Kw. | Load Factor, per Cent |
|---|---|---|
| 2 | 13,500 | 35.5 |
| 10 | 11,550 | 41.8 |
| 15 | 10,150 | 47.3 |

The principle of operation of the power indicating and limiting system is quite complicated, although the operation is entirely automatic and it is not liable to derangement. The basic instrument is a Kelvin balance type contact-making wattmeter, arranged to measure accurately the total power supplied. One of these is installed in each substation. At the Quilicura substation, No. 5, is located a 2-kva. motor-generator set consisting of an alternating-current generator driven by an adjustable speed direct-current motor, whose speed is controlled by the contact-making wattmeter. With no load on the substation this speed is set to give 25 cycles on the generator. The direct current for operating this set is obtained from another motor-generator set fed from the a.c. station service bus.

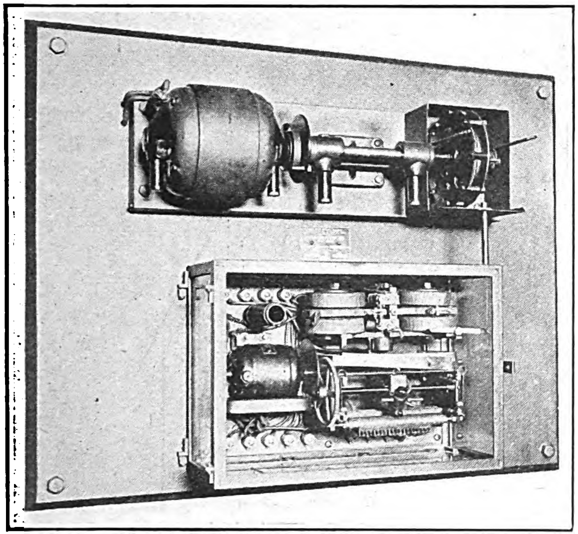
The variable-speed d.c.-a.c. set drives a small synchronous motor that operates a magnetic torsion device connected mechanically to the beam of the wattmeter, the equipment being combined to produce an alternating frequency varying with the power input to the station in such a way that the excess frequency above 25 cycles is proportional to the power input to the station.

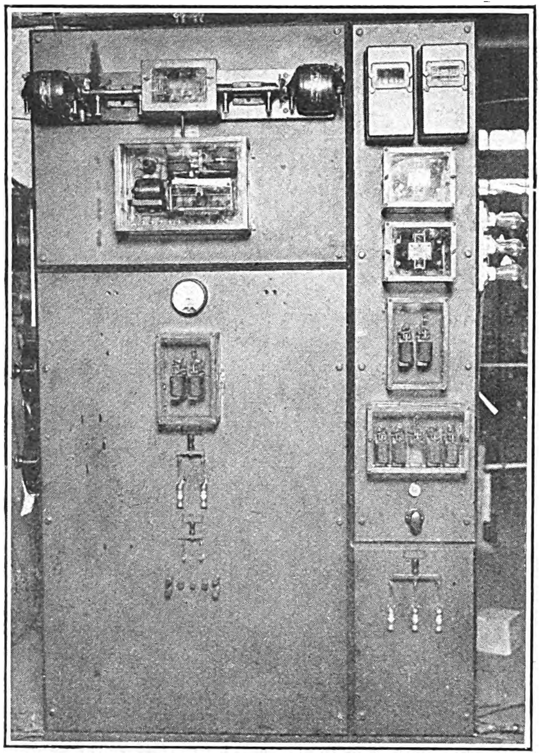
An electromotive force carrying this variable frequency is transmitted at approximately 2,200 volts over two aluminum conductors carried on cross-arms on the trolley poles to substation No. 4, at Rungue, where there is a similar equipment to that at Quilicura, except that instead of a single small synchronous motor operating in conjunction with the wattmeter there are two synchronous motors with magnetic torsion devices, one driven by power from No. 5 substation and the other receiving power from the variable-speed motor generator in No. 4 substation.

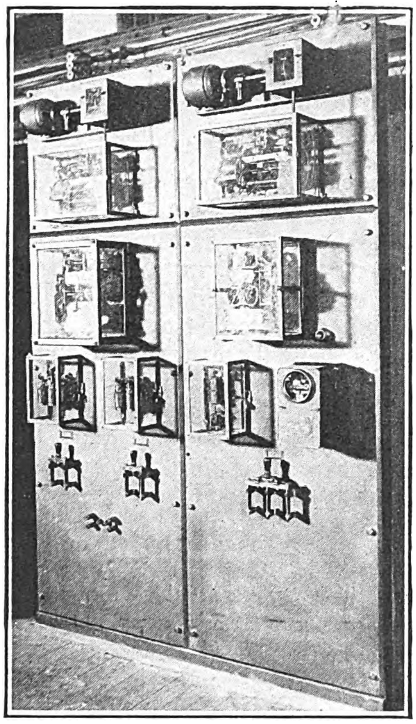
This equipment is so arranged that the speed of the motor-generator produces a frequency equivalent to that transmitted from substation No. 5, augmented by an amount proportional to the power input to substation No. 4, the new frequency thus being equivalent to an amount in excess of 25 cycles proportional to the sum of the power inputs to the two substations combined.

The new frequency is then transmitted on to No. 3 substation at Llai Llai, where there is similar equipment, increasing the frequency by an amount proportional to the power input at that station, then to No. 2 at San Pedro and to No. 1 at Vina del Mar, from where the total power indication, expressed in frequency, is finally transmitted to the dispatcher's office at Baron in Valparaiso.

At the load dispatcher's office the variable-frequency alternating current drives a small synchronous motor actuating a magnetic torsion device, which is connected mechanically to a contact-making wattmeter similar to that in Substation No. 5. This wattmeter receives power from a local source, and is provided with a means of automatically adjusting the amount of power supplied to it proportionally to the excess over 25 cycles; that is, to the total power input to all the substations.







**The Power Demand Integrating Mechanism**

At left, end station panel of power indicating system at Quilicura.

At right, equalizer panel for intermediate stations in power indicating system.

Below, control panels in dispatcher's office at Baron.

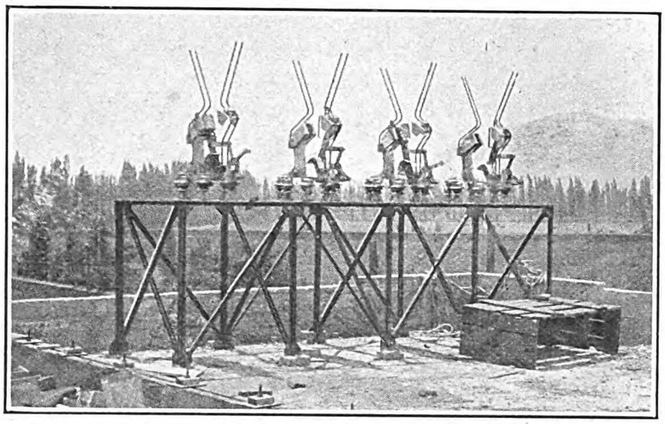
In series with the contact-making wattmeter are a graphic wattmeter and a combined watt-hour meter, and maximum demand meter measuring the integrated energy consumption as well as the maximum integrated demand over a period of 15 minutes. There is also a maximum demand limit meter.

Control of the power demand is accomplished through a combination of relays in the load dispatcher's office so arranged that when a predetermined load is reached a series of impulses is sent out over the power indicating and limiting circuits, which actuate relays in the various substations to control the generator field rheostats and lower the trolley voltage sufficiently to maintain the load within the required limit. As the power demand decreases the trolley voltage is restored to normal.

The impulses are transmitted from station to station by direct current carried through the middle taps on the transformers. This direct current is supplied from the motor-generator set in the dispatcher's office, which is fed directly from the power company's system. A rapid rise in power peak exceeding the setting desired, and which would be beyond the limit of control of voltage on the motor-generator sets, is avoided by transmitting a higher current through the circuit. This trips the circuit breakers and takes the stations off the line.

When power is returned to the line by regenerative braking this is credited by the meters, so that the measurements represent the net power being delivered to the substations. On this electrification the maximum spacing of stations is 31 miles on a section of relatively light traffic and easy gradients, while the shortest section, 20 miles long, has the heaviest grades in the entire engine division. The densest traffic is on the Valparaiso end of the line, between Puerto and El Salto, in which a number of suburban trains are run in addition to the through trains. The next most important section is that between El Salto, Las Vegas and Llai Llai. A number of passenger trains are run to the latter station from Valparaiso and others from there to Los Andes. Several freight trains cover this section, and are diverted to the Los Andes branch at Las Vegas. The section of the line between Llai Llai and Santiago has the most severe gradients, reaching the maximum elevation of approximately 2,600 ft. above sea level, but the number of trains is smaller.

Substation No. 1, Vina del Mar, will be quite heavily loaded, and requires the two 2,000-kw. motor-generators now installed to handle the initial installation. Station No. 3, at Llai Llai, will be the heaviest loaded station of the five, since it will supply energy to the locomotives hauling trains up the heavy grade section to the summit of the mountain, and also will supply energy to the Los Andes branch and northward toward substation No. 2. Two motor-generator sets will be sufficient for a limited time, and increased traffic will require the installation of a third set.



The 2,000-Amp., 3,000-Volt Yard Feeder Switches Are Mounted on the Roof of the Substation Building

Stations 2, 4 and 5, at San Pedro, Rungue and Quilicura, did not from capacity requirements need two 2,000-kw. motor-generator sets, but from the standpoint of reliability two were installed at the request of the railroad. Quilicura is the end station, and classification yards at Yungai receive their energy from this station. When the electrification is extended southward past Santiago, this station will serve to feed a considerable section of the new installation.

The substation spacings and layouts were selected to provide for an increase in the traffic to approximately 2¼ times that which existed in 1921. Each building has provisions for the installation of a third motor-generator set when needed.

The feeders, like the substations, were arranged to handle traffic 50 per cent greater than that in 1921. All aluminum feeders were used, largely on account of its lower cost at the time the equipment was purchased, and steel-reinforced aluminum conductor was found unnecessary on account of the small stresses. The feeder used is a 795,000 circ.mil, which is equivalent to 500,000 circ.mil of copper. On the Los Andes branch two 596,000 circ.mil feeders are used, each of which is equivalent to approximately 375,000 circ.mil of copper.

On the heavy traffic sections from the summit of the mountain northward the drop was limited to a maximum of approximately 350 volts. Eastward from the summit toward Santiago the maximum drop may run occasionally as high as 550 volts, but this will be exceptional, even with traffic 50 per cent in excess of that figured on. The lowest potential probably will occur on the Los Andes branch, but the traffic there is very light and there is ample leeway in the schedules. The drop can be reduced when the traffic warrants by running a short-cut feeder across the mountain from Rungue or in several other ways. The feeder capacity between the summit at La Cumbre and Llai Llai is such as to limit the drop on motoring to 350 volts and the voltage rise on regeneration to between 250 and 300 volts. These values are, of course, calculated and may vary somewhat in operation.

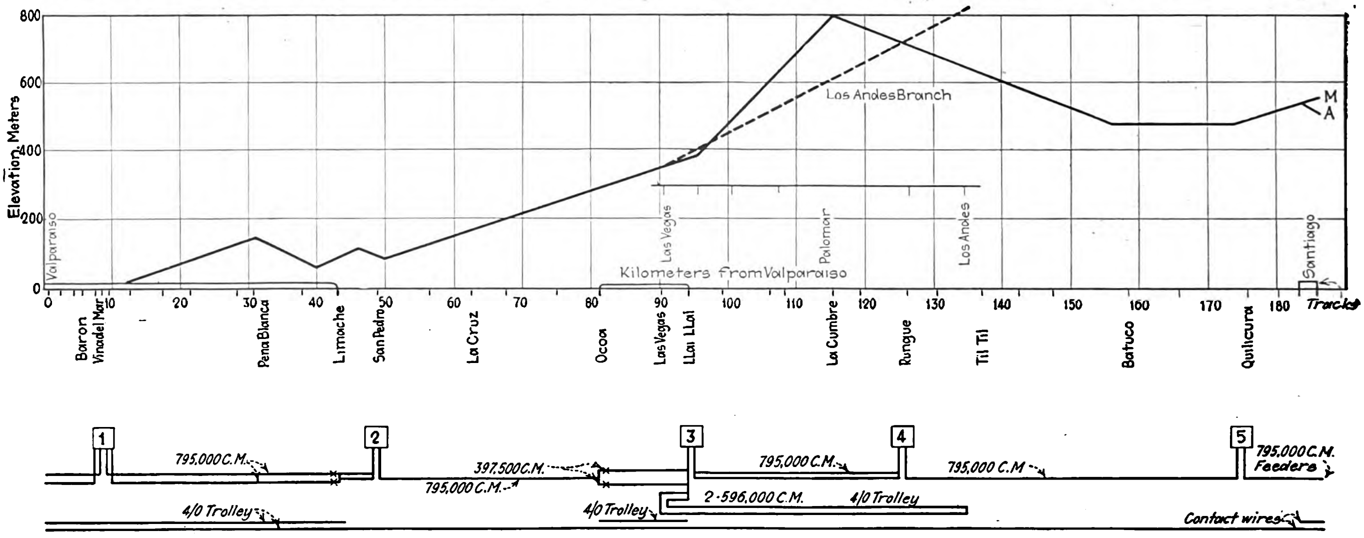
A single No. 0000 copper trolley wire is strung over each main track, while in the yard the size was reduced to No. 00 copper trolley. Between the feeders and the trolley there is sufficient current capacity that any substation may be shut down while continuing to operate trains, although, of course, they would operate at reduced speed in the vicinity of the station out of service.

The electrical equipment for the substations, with the exception of a few minor items, was manufactured by the Westinghouse Electric & Manufacturing Company, and was installed under the direction of that company's engineers. The buildings were constructed by Errazuriz Simpson & Company.

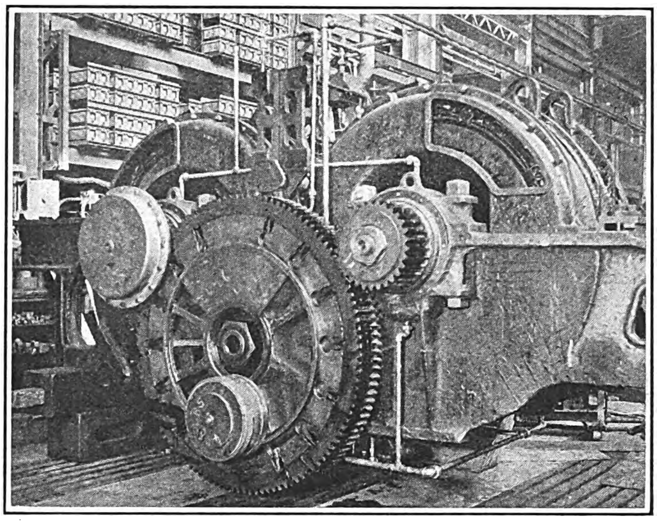
# Details of New Pennsylvania Electric Locomotives

### Additional Information on 200-Ton Engines Designed for Either A.C. or D.C. Operation and for Preference Freight or High-Speed Passenger Service

In FEBRUARY of this year the Pennsylvania Railroad completed the first of three similar electric locomotives, one of them for use in either freight or passenger service on 11,000 volts, 25 cycles, alternating current and the other in passenger service on 650 volts direct current. The mechanical parts were designed and built by the Pennsylvania Railroad, and the electrical parts by the Westinghouse Electric & Manufacturing Company. The locomotives were assembled at the Juniata shop of the railroad. A description of these locomotives was published in ELECTRIC RAILWAY JOURNAL for Jan. 26, 1924, page 133, and a photograph was


800
600
400
200
0
Elevation, Meters
Valparaiso
Los Andes Branch
M
A
Las Vegas
Palomar
Los Andes
Santiago
Kilometers from Valparaiso
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
Tracks
Baron
Vinadel Mar
Pena Blanca
Limache
San Pedro
La Cruz
Ocoa
Las Vegas
Llai Llai
La Cumbre
Rungue
Til Til
Batuco
Quilicura
1
2
3
4
5
795,000 C.M.
397,500 C.M.
795,000 C.M.
795,000 C.M.
795,000 C.M
795,000 C.M. Feeders
4/0 Trolley
4/0 Trolley
2-596,000 C.M.
4/0 Trolley
Contact wires

Condensed Profile, Feeder Layout and Substation Location Diagram for the Electrified Section of the Chilean State Railways



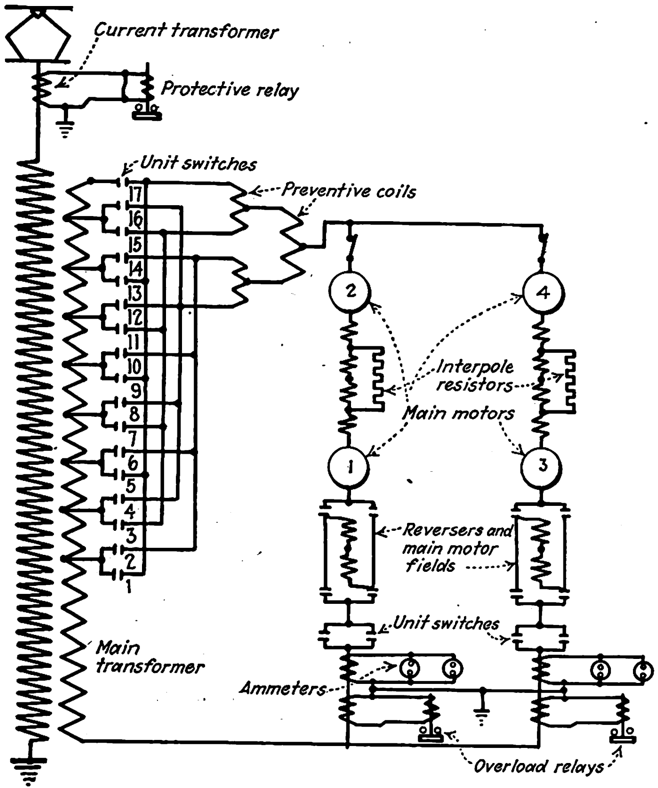
Motor and Gear of the Pennsylvania Locomotive Assembled for Testing

published on Feb. 9, page 218. Further details are now available and are given below.

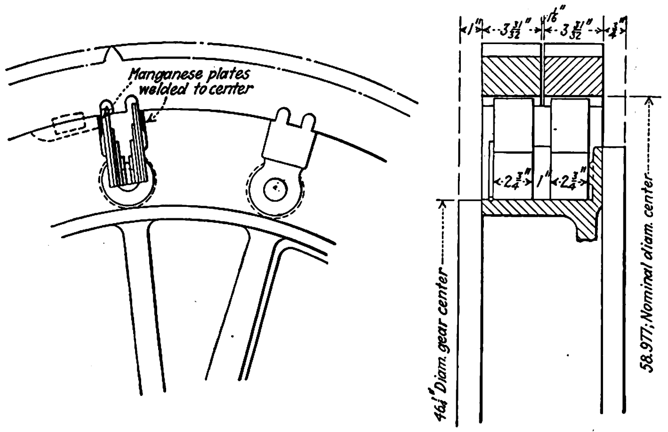
The first locomotive, known as the L-5, was placed in freight pusher service on the 11,000-volt alternating-current section between Overbrook and Paoli, Pa. A second, equipped for passenger service at 650 volts direct current, and known as the L-5-A, has just been completed and will be placed in service at the New York terminal.

Each locomotive weighs 408,600 lb. total, of which 308,600 is on drivers, and is equipped with four Westinghouse type 418 single-phase commutator motors. Two of these motors are geared to a jackshaft, which is connected to two pairs of drivers through the side rods. The two center drivers are flangeless.

Lubrication of motor and jackshaft bearings is obtained by an oil circulation system. Under each jackshaft, cast integrally in the main frame, is an oil reservoir holding an adequate supply of oil. Geared to the jackshaft is a plunger type pump which, when the locomotive is running, pumps the oil from the reservoir to a distributing manifold. From this point, the oil flows under low pressure to each motor and jackshaft bearing, and thence back to the reservoir. An indicator, consisting of a sight feed valve, is located in each operating cab.



Schematic Control Diagram for New Pennsylvania Locomotive


Manganese plates welded to center
1"
3 31/32"
1/16"
3 31/32"
1/4"
2 1/4"
1"
2 1/4"
46 1/4" Diam. gear center
58.977 Nominal diam. center

Details of Flexible Gear of Pennsylvania Locomotive

The guiding trucks on each end of the locomotive are of the radial center-bearing type equalized with the main drivers through bell cranks and tension rods. Flexibility is obtained between the truck and bearing plate by means of transverse flat leaf springs resting in the swing links supporting the weight on the truck.

Each jackshaft is equipped with two sets of flexible gears, one set on each end of the shaft. A set of gears consists of a cast steel gear center carrying the side rod pin, two heat-treated gear rims and a number of flat spring flexible units interposed between the gear rims and the center as shown in an accompanying drawing.

The motors each carry two pinions meshing with the gears, the pinion on the motors nearest the center of the locomotive being solid and those on the outer motors being flexible. The flexible pinions are similar in construction to the gears, using duplicate flexible elements.

THE L-5 GEARED FOR A.C. FREIGHT SERVICE

| | Amp. per Motor | Brake Hp. | Tractive Effort, Lb. | Speed M.p.h. |
|---|---|---|---|---|
| At maximum tractive effort... | 4,250 | 3,450 | 100,000 | 12.5 |
| At one hour rating........... | 2,600 | 3,300 | 59,000 | 21 |
| At continuous rating......... | 2,300 | 3,070 | 50,000 | 23 |

THE L-5 GEARED FOR D.C. PASSENGER SERVICE

| | Amp. per Motor | Brake Hp. | Tractive Effort, Lb. | Speed M.p.h. |
|---|---|---|---|---|
| At maximum tractive effort... | 4,250 | 3,450 | 54,000 | 22 |
| At one hour rating........... | 2,600 | 3,300 | 29,500 | 42 |
| At continuous rating......... | 2,300 | 3,070 | 25,000 | 46 |

The traction motors are of the interpole type and the excitation of the interpole fields is adjusted by suitable resistance shunted across the interpole winding. The main circuits of the alternating-current locomotive are shown in the accompanying diagram.

The air brake equipment is the type 14-EL., an adaptation of the No. 6-E.T. to electric locomotives. Compressed air is furnished by a single compressor having a capacity of 150 cu.ft. of free air per minute when operating against a pressure of 140 lb. per square inch.

Energy for control and lights is obtained from a 30-volt storage battery, which is charged from a small motor-generator set consisting of an alternating-current single-phase motor and direct-current generator.

The ratings of the L-5 locomotive geared for both passenger and freight service are given in the accompanying table.

# Toronto Shop Has 5 Acres Under One Roof

**This Building, the Principal One of the Group Recently Completed by the Toronto Transportation Commission, Was Designed so as to Involve the Minimum Movement of Materials, Equipment and Men—The Arrangements Provide for About 1,800 Cars, Including All Departments Necessary for Overhauling and Painting**

THE car repair shop of the Toronto Transportation Commission is the largest one of the group of buildings at the Hillcrest Yard, recently built as a part of the rehabilitation program that has followed the operation of the property by the municipality. A preliminary article on this shop was published in the ELECTRIC RAILWAY JOURNAL for April 28, 1923, page 723, and a general description of the entire group of buildings was published in the May 24, 1924, issue, page 801.

When the commission took over the property of the old Toronto Railway, the shops and equipment were found entirely inadequate for the work they had to do. The condition was such that, with the purchase of new cars and with increased service, a new shop with modern facilities was essential. Accordingly plans for the present shop were begun as soon as the final steps were taken to acquire the railway. The entire layout, based on a system operating 1,800 cars, has been planned to obtain efficiency in repair work and conserve movements, both of the cars and parts under repair and of the men engaged on the work.

The main shop is a single building 452 ft. 2 in. long and 466 ft. 10 in. wide, divided in the middle by a transfer table which traverses the entire width of the building. The transfer table occupies a space 50 ft. x 566 ft., including a 50-ft. extension at each side of the building. This makes a total area under one roof of slightly more than 218,000 sq.ft. The useful floor area of the building is 181,790 sq.ft. or about 4 acres.

The building is designed and laid out as a complete unit, embracing under the one roof all the separate departments engaged in car repair work. For the most part it is a clear open space. Only the paint section, the "free stores," the forge shop and a lunch room for the men are partitioned off. This arrangement was decided on as permitting intimate association, promoting co-operation, and tending to stimulate good work among the employees. On account of the rather severe winters in Toronto it is particularly desirable to have the work concentrated in this manner, as with it there is no necessity for the men to go outdoors for any purpose in connection with their regular work.

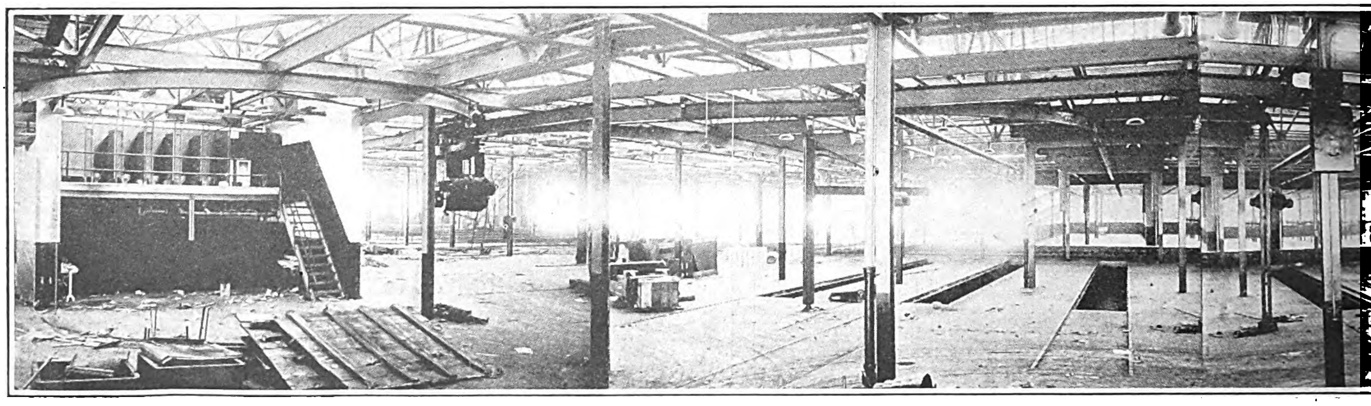
One of the particular features of this building is the good natural lighting, which is obtained through the use of skylights in the roofs. These are of the familiar saw-tooth variety, with the glazed portions facing the north. By this means a diffused light is available, which is reflected from the white ceilings to the working floor below. This natural lighting is sufficiently uniform that no shadows are cast by objects or workmen on the floor of the shop. In addition to the skylights, fully half of the side walls are of glass. The light is sufficient for accurate work even on dull days, as is evidenced by the interior photographs illustrating this article, most of which were taken on a cloudy day.

The shop building is heated with a hot-air system. Steam from the main heating plant is passed through coils within an air chamber located in the basement near the southwest corner of the building. From here it is forced by a fan through a system of ducts reaching every portion of the shops, except the paint shop, where direct steam heat is used in order to minimize dust and facilitate drying. Outlets from the hot-air ducts are provided at frequent points so that the shop is kept at a uniform temperature.

## THE TRUCK SHOP HAS SPACE FOR 29 CARS

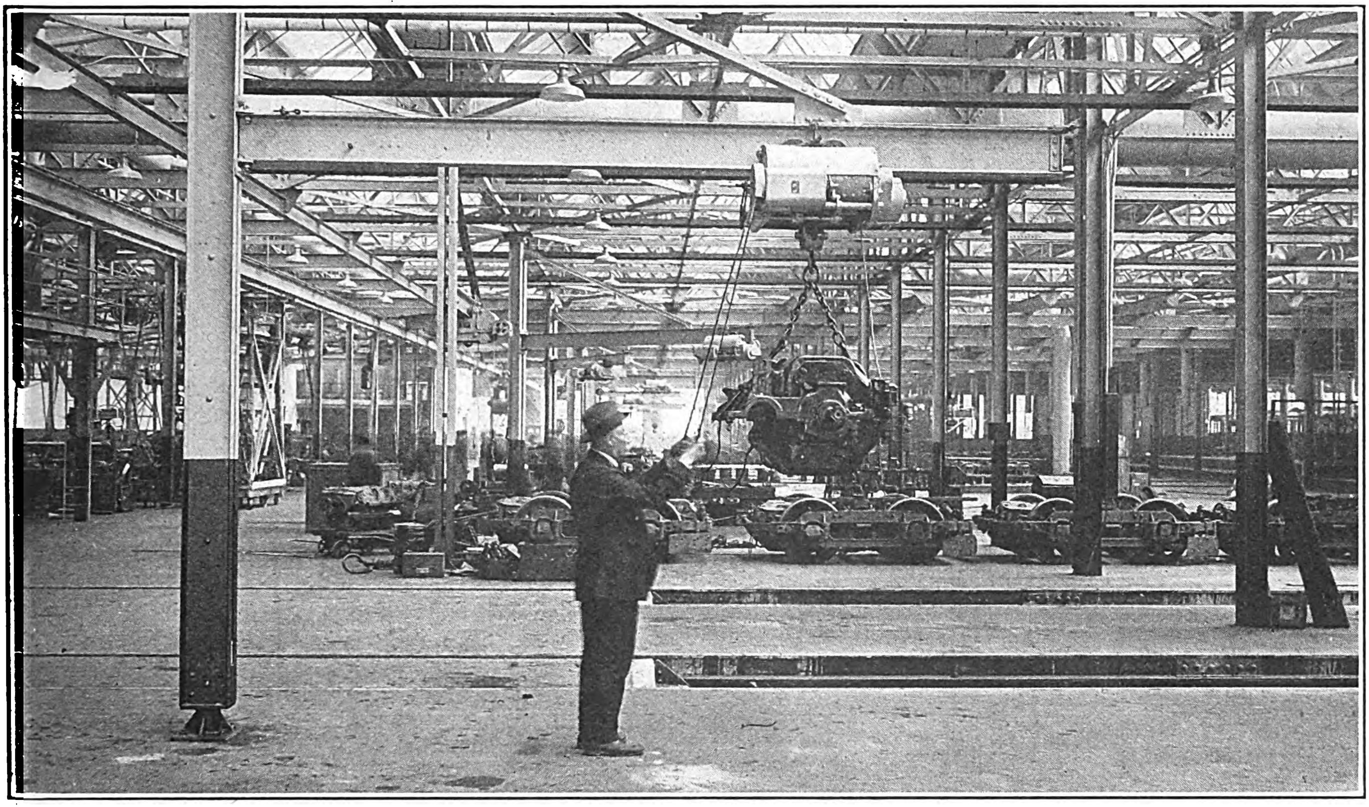
The truck shop occupies the space directly south of the transfer table. It is 100 ft. wide and the full length of the building, with 29 tracks, each of which has ample capacity for handling a car. Four tracks at each end of the building, or eight in all, are equipped with car hoists. The tracks at either end of the shop are fitted with a wheel grinder.

All of these tracks are connected with the machine shop, armature shop, forge shop and the free stores by means of an overhead monorail system, which is used for the handling of heavy parts such as wheels and axles,



**Panoramic View of Toronto Shops**

The view on these facing pages, taken before the shops were occupied, shows in general the layout of the building. The storeroom and forge shops are behind the partition at the extreme left. To their right is the main truck and motor shop, with the car body shop and woodworking department in the background beyond the transfer way. Further to the right in the background is the paint shop, and at the extreme right are the machine shop and winding room.



Looking West in the Truck Shop. One of the 14 Jib Cranes Is Shown in the Foreground

motors, etc. A 5-ton Shepherd electric crane, shown in an accompanying illustration, is used on the monorail system.

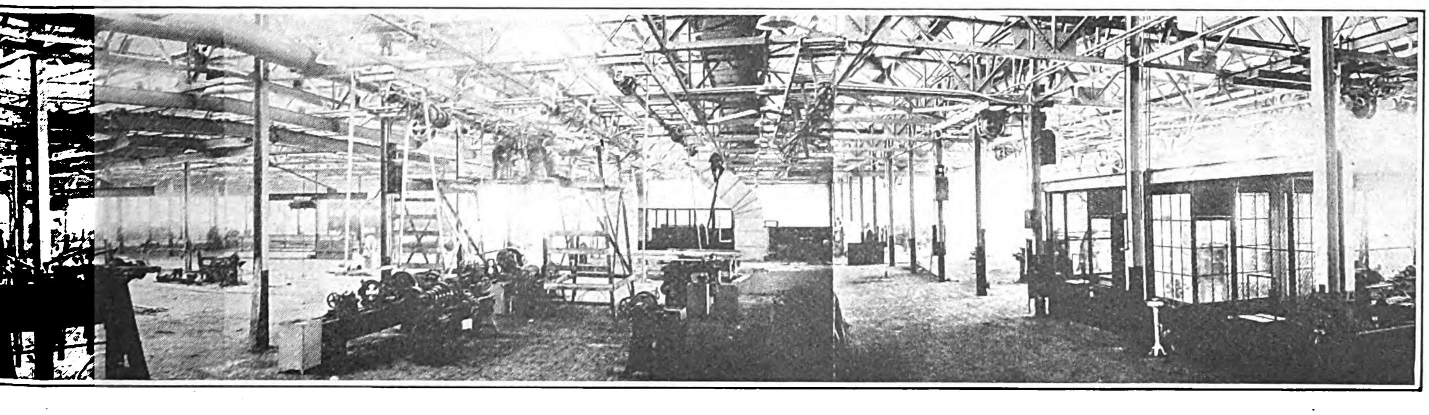
An individual jib crane is provided between each two tracks in the truck shop. In this department and in the machine shop there are in all 14 of these jib cranes of 1½-ton capacity and one of 1-ton capacity. Each has a radius sufficient to handle trucks and motors on the two tracks which it serves, and to place material within reach of the main monorail system. Each crane is equipped with an electric hoist.

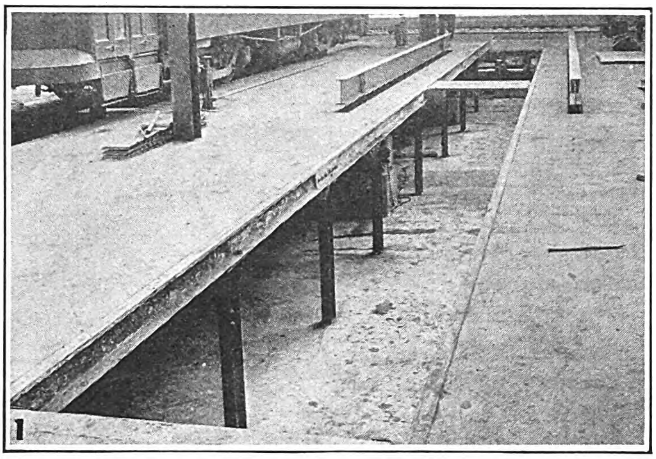
Loose dirt is removed from the motor cases, after they are taken out from the trucks, by means of a special vacuum cleaner. The motor to be cleaned is set on the shop floor adjacent to the intake of the vacuum system and a canvas-covered wooden frame placed over it, covering it completely. Suction is provided by the motor-driven vacuum pump shown in one of the accompanying illustrations, which is mounted on a platform above the floor. With the motor in position the nozzle of a hose connected to the shop air line ~~is~~ inserted through a hole in the canvas cover, and the air pressure is turned on. This nozzle is moved around within the case, and all loose dirt is blown off the motor, the dust being carried through the suction line into the receptacle of the cleaner on the platform, where it is deposited. Thus all the dirt is confined, and the operation can be conducted in the shop without interfering with other operations.

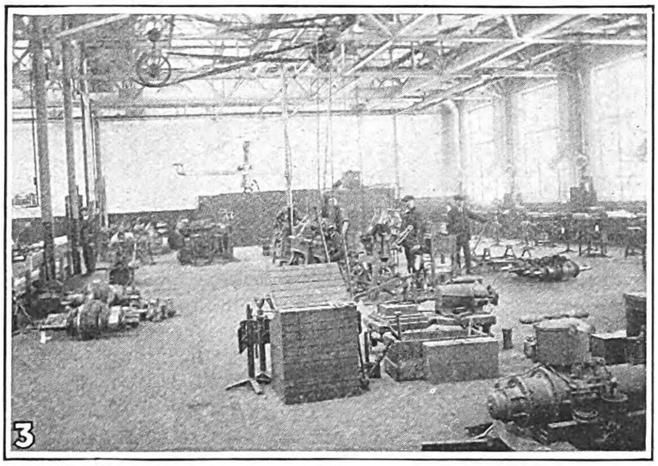
The winding room, machine shop, forge shop and free stores are all located adjacent to and separated by a 6-ft. aisle from the motor and truck shop. This layout is such as to compel the shortest possible movement by truck or monorail of material to and from the various production departments to the motor and truck shops, which is the point of demand for such material.

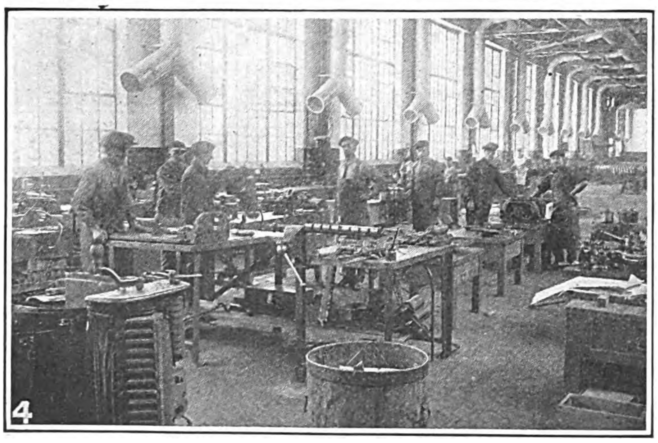
### THE FORGE SHOP

The forge shop is located in the southwest corner of the main building, adjacent to the free stores, to which the bulk of the material produced is delivered. Another reason for this location of the forge shop was to keep dust and dirt as far away as possible from the electrical and mechanical work. This location also permits the unloading of fuel oil used in heating the furnaces, the bulldozer, etc., by gravity direct from the steam railroad









No. 1. The pits are of open construction, forming a shallow basement under the entire truck shop. The car hoists of the type shown beside this pit are placed on eight tracks.

No. 2. The forge shop has excellent facilities for car repair work.

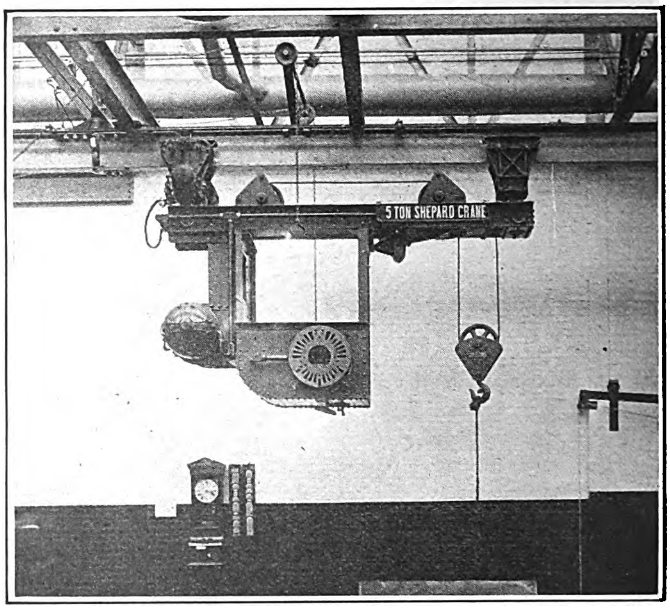
No. 3. The armature winding department.

No. 4. The controller and air-brake sections are adjacent to the winding room and the machine shop.

track at the west of the shop into an underground storage tank.

Forge coal is stored in a basement beneath the free stores, which keeps it dry and in good condition and also obviates the necessity of the helpers going to an outside storage, which wastes time and is dangerous to health in winter.

The eight forges are of the down-draft type. Air pressure for the fires is delivered through a glazed tile pipe which is laid in the exhaust tunnel. There are two direct-connected, air-operated forging hammers, one of 800-lb. and one of 160-lb. capacity. Two gas-fired heating furnaces, one 36 x 36 in. and one 36 x 72 in., and one large-sized electrical heat-treating furnace are installed. The electric furnace is equipped with necessary instruments and apparatus to provide automatic heat control. In addition to this equipment there are large and medium-sized, direct-connected, motor-driven punches and shears, a bulldozer, an emery grinder, an oil furnace, a hardening furnace and a spring furnace. Space has been provided for a forging machine and a furnace which may be installed later. The electric babbitt-melting furnace and the gas furnace for melting out babbitt from bearings are also located in the blacksmith shop.



**The Monorail System, Which Serves the Truck and Machine Shops, Is Equipped with a 5-Ton Crane**

The electric and acetylene welding equipment are in the southeast corner of the forge shop, screened to prevent glare. Space also has been provided here for the manufacture and repair of fenders and lifeguards.

### MATERIAL IS CONTROLLED THROUGH THE FREE STORES DEPARTMENT

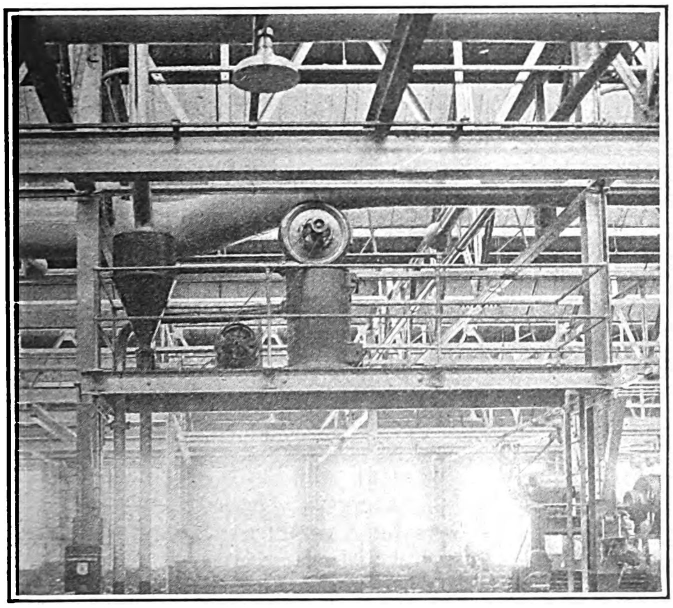
Located between the blacksmith shop and the machine shop is the "free stores," in which are stored and through which pass all incoming and outgoing car parts for repair and also those already repaired. This department is really a clearing house between the divisional carhouse shops and other departments sending material to be repaired and the main repair shop. The duties of this department are to account for all materials received for repair from the carhouse or from other departments of the commission. One of the duties of the storekeeper is to inspect all materials, including scrap, to decide whether it can be repaired or reclaimed, and whether materials such as brakeshoes have been worn to the fullest extent.

The oil reclamation and oil and waste soakage room is located in a section of the free stores.

The machine shop is located between the winding room and the free stores. A general foreman's office, sub-storeroom and toolroom are placed in the center of this space.

The various machines and their locations in the shop are shown in the diagram. A horizontal boring mill and a planer are located on the main aisle dividing the motor and truck shop from the machine shop, so that motors and truck frames need only be swung across the aisle from one department to the other. A new turret lathe for axle bearings and trolley wheels has been installed. It is anticipated that this tool will do the work of three ordinary lathes.

A group consisting of a heavy four-spindle drill and four lathes of various sizes is installed near the main aisle. These machines, which are all new and modern, are designed for high-speed steel and quick change devices for variable speeds and feed. It is estimated that these machines will save at least 40 per cent over the obsolete type of lathes in the old shop, so that for the same amount of work only 60 per cent as many lathes were installed here.

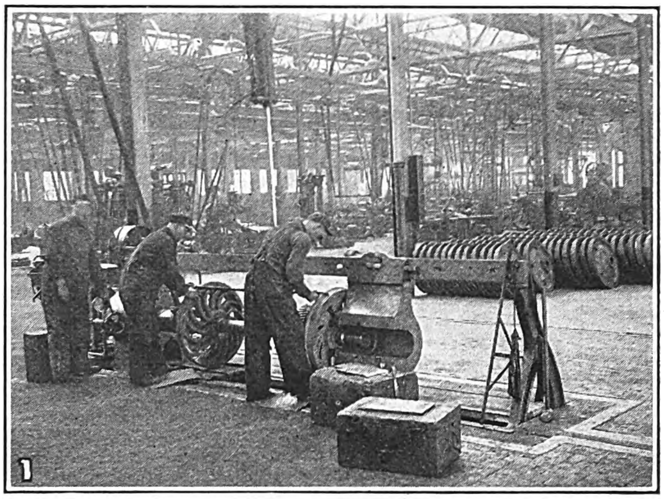


**By the Use of the Vacuum Cleaner, Motors May Be Freed from Loose Dirt Without Causing Dust in the Shop**

The wheel-fitting department directly adjoins the free stores, because the heaviest and greatest quantity of material passes between these departments. In this department are an axle lathe, a wheel borer, a wheel press and a tool grinder. Space is provided for a steel wheel turning lathe should it be decided at any time later to use steel wheels instead of the cast-iron wheels with which all the Toronto cars are equipped.

### EQUIPMENT OF THE WINDING DEPARTMENT

The armature department is located in the southeast corner of the building and without a dividing partition, although it is partially separated by lockers and sub-storerooms. It is provided with 10 armature winding racks, three coil-winding machines, two coil-taping machines and two coil presses. There also is a small wind-



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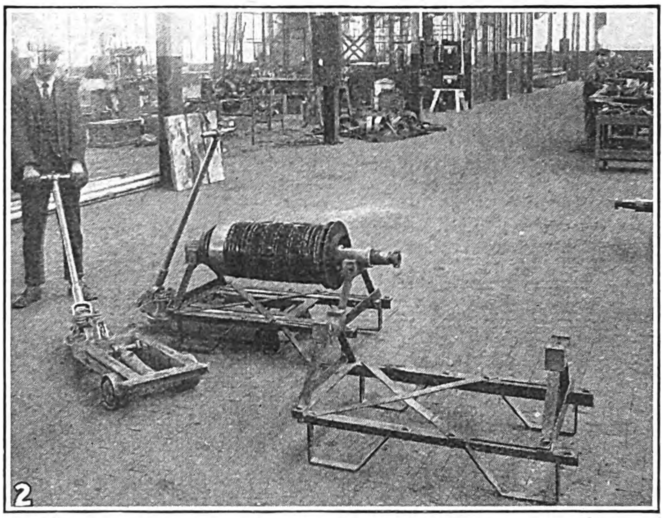

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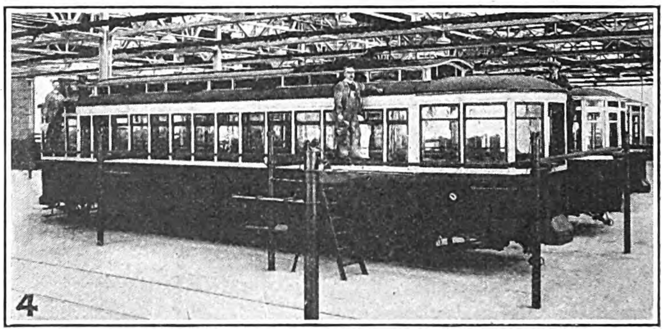
3



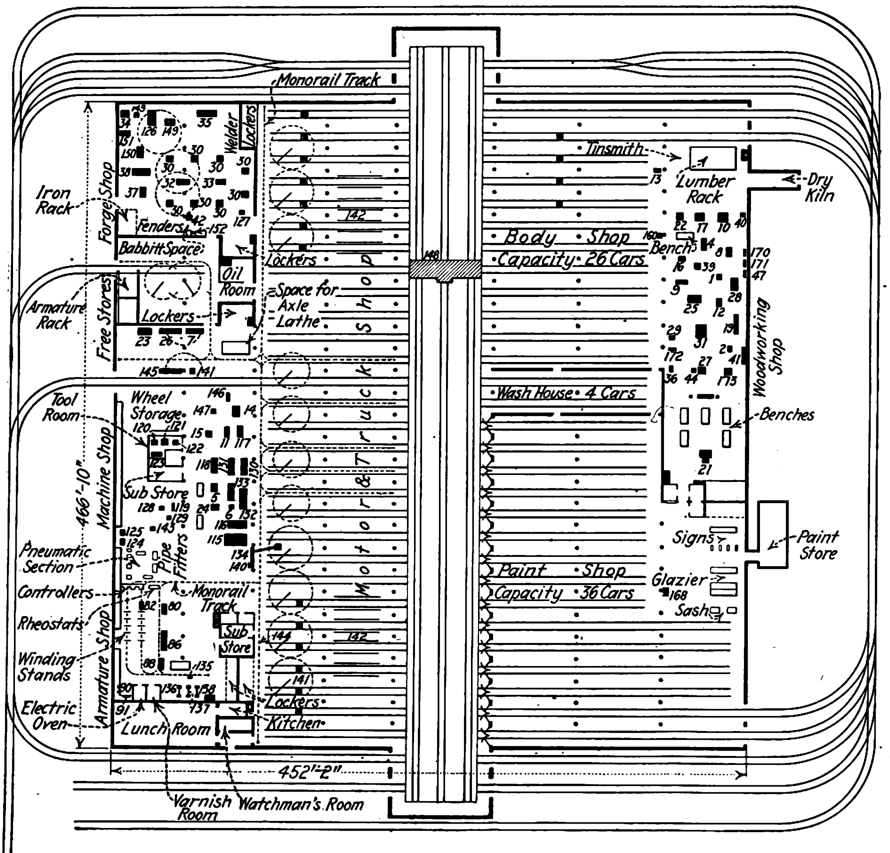
4

No. 1. The wheel press is located adjacent to the storeroom.

No. 2. Transveyor trucks are used for transporting many articles of moderate weight, such as armatures, about the shops.

No. 3. The transfer table separates the machine work from the body and paint shops. The body shop is shown at the left, and the wash room and paint shops, in the background, are inclosed.

No. 4. In the paint shop permanent posts with movable brackets make it easy to adjust the scaffolding.


Monorail Track
Iron Rack
Forge Shop
Welder
Lockers
Fenders
Babbitt Space
Oil Room
Lockers
Armature Rack
Free Stores
Lockers
Space for Axle Lathe
Tool Room
Wheel Storage
Machine Shop
Sub Store
466'-10"
Pneumatic Section
Pipe Fitters
Controllers
Monorail Track
Rheostats
Sub Store
Winding Stands
Armature Shop
Electric Oven
Lunch Room
Lockers
Kitchen
452'-2"
Varnish Room
Watchman's Room
Motor & Truck Shop
Tinsmith
Lumber Rack
Dry Kiln
Body Shop
Capacity 26 Cars
Bench
Woodworking Shop
Wash House 4 Cars
Benches
Signs
Paint Store
Paint Shop
Capacity 36 Cars
Glazier
Sash

General Plan of New Toronto Shops and Layout of Principal Machines

**Machine Shop**
5. Universal milling machine
6. Wet wheel grinder
7. Axle lathe
11. Radial drill
14. Bolt cutter
15. Drill press
18. Shaper
23. Boring mill
24.* Shaper
26. Wheel press
115. Planer
116. Horizontal boring and milling machine.
117.* Four-spindle drill
118.* Turret lathe
119.* Lathe
120.* Tool room grinder
121.* Milling machine
122.* Drill grinder
123.* Tool room lathe
124*, 125.* Combination grinder
128.* Three-spindle drill
130.* 24-in. lathe
131.* 20-in. lathe
132.* 36-in. lathe
133.* 18-in. lathe
134.* Vacuum cleaner
140*, 141.* Wet wheel grinder
143* Power press
145. Wheel press
146.* Bolt cutter
147.* Machine saw

**Armature Shop**
80. Binding machine
82. Hydraulic press
86. Lathe
88. Commutator slotting machine
90, 90. Coil presses
91, 91. Taping machines
135.* Insulation test
136-7-8.* Coil winders
139.* Stove armature winder

**Forge Shop**
20. Bolt cutter
30, 30. Forges
32. Large hammer
33. Small hammer
34. Gas furnace
35. Blast fan
37, 38. Punch and shears
42. Melting out furnace
126.* Bulldozer
127.* Wet grinder
149, 149.* Oil furnaces
150.* Roll former
151.* Square shear
152.* Babbitt furnace

**Woodworking Shop**
1. 36-in. bandsaw
2. Boring machine
4, 9. Jointers
8. Self-feed ripsaw
10. 12x26-in. planer
12, 16. Trimsaws
13. Drill press
17. 8x27-in. planer
28. Molder
19. Belt sander
21. Roller sander
22. Bandsaw
25. Shaper
27. H. C. mortiser
29. Jigsaw
31. Tenoner
36. Dowel machine
39. Sash sticker
40. Swingsaw
41.* Wood turning lathe
44.* Chain mortiser
47.* Knife grinder
160.* Wet wheel grinder
170.* Bandsaw filer
171.* Circular saw filer
172.* Grindstone
173. Disc sander

**Paint Shop**
168.* Wet wheel grinder

**General**
148.* Transfer table
141.* Jib cranes
142.* Car hoists
144.* 5-ton monorail
*Indicates new machines

ing machine for armatures for the car heater blowers. A varnish room and an electrically heated baking oven provide for finishing the armatures and a high-tension insulation testing set for testing them. A commutator slotting machine, a hydraulic press for commutators, a lathe for turning commutators and a banding machine complete the equipment in this section.

A sub-storeroom is located to the north of the armature department, where supplies are kept for both the armature and motor and truck departments, being issued as required by the departmental foremen. Offices for the foremen of these departments are located adjacent to this storeroom.

The air-brake and controller sections are located between the armature department and the machine shop, from both of which the repairing and overhauling of controllers and air brakes require material.

For the handling of light and small materials a system of communication by means of transveyor trucks, and a number of platforms for use in connection with them, has been provided. Thus material when unloaded from the supply car or motor truck can be placed on the platforms and tables and conveyed to the various departments for necessary repairs, thus making it possible to keep all materials off the floors, and resulting in a clean, orderly shop, together with considerable saving in time and expense.

A special use of the transveyor trucks is for transportation of armatures. Instead of being laid on the floor, each armature is stored on a rack designed for the purpose, with brackets for supporting the two ends of the shaft. These are of steel angles and straps, making them light but strong. In order to move an armature one of the transveyor trucks is run directly beneath the frame, and by a movement of the handle the truck lifts the frame off the ground so that it may be carried readily anywhere in the shop.

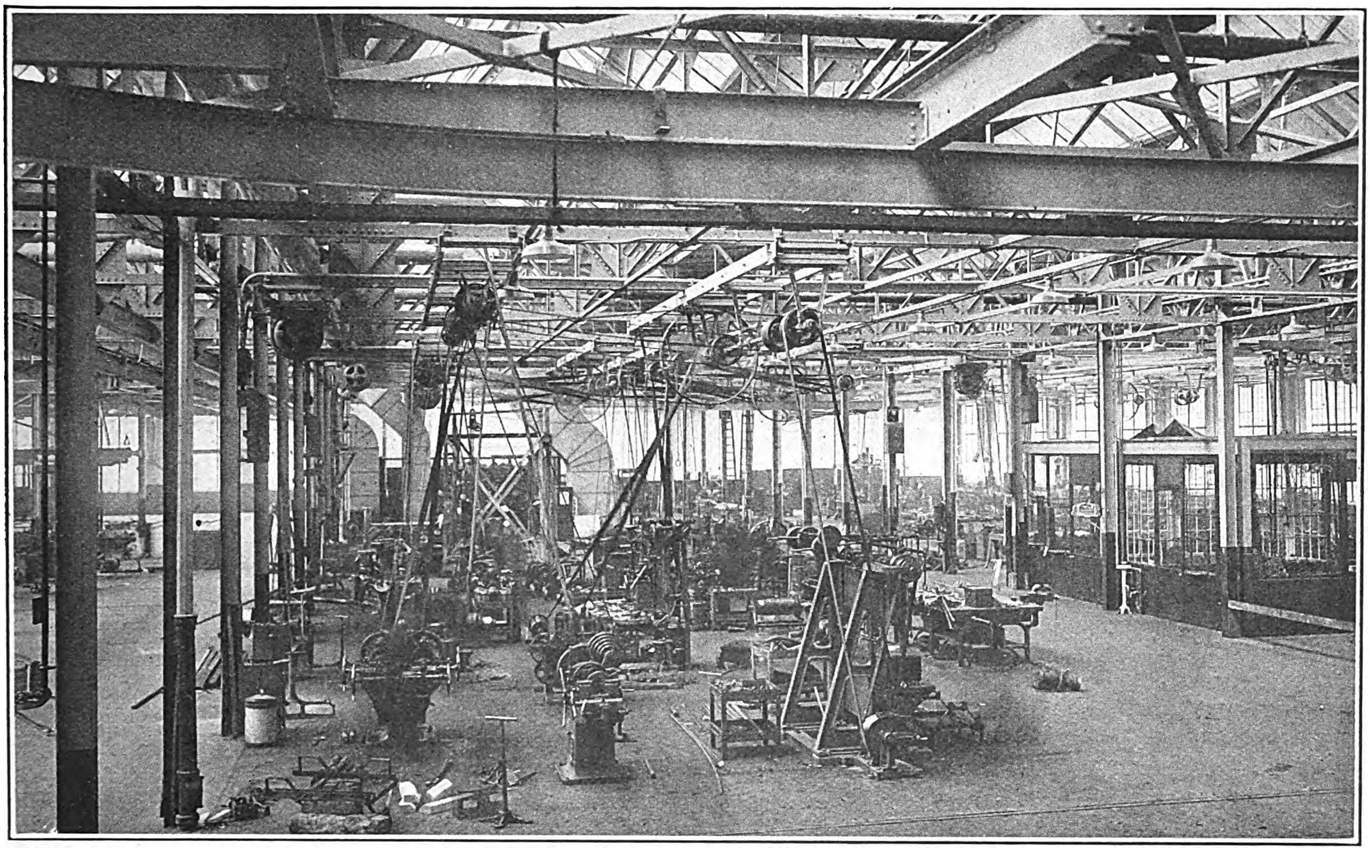
### CAR BODY AND WOODWORKING SHOPS

The north side of the shop is assigned to car body work, the woodworking mill, the wash house and the paint shop. The car body shop is located directly north of the transfer way, and occupies about 45 per cent of the north portion of the building. There are 14 tracks of two-car length, giving a capacity of 28 cars for body repairs. The tracks in this department are directly in line with those in the motor and truck department, enabling car movements from the truck department, the second step in the progress of the car, to the car body shop by means of the transfer table with the least possible time and effort, and without interfering in any way with the other cars in process of repair.

A car straightener has been built into the floor on one of the tracks in the body shop. The arrangement, which is somewhat different from some other recent straighteners, is shown in accompanying illustrations.

The space north of the body shop is assigned to the woodworking department. This shop is equipped with 23 machines, 18 of which were selected from the 41 in use in the old shop. Four new machines were added because of their greater efficiency. These are a double surfacer, a chain mortiser, a universal woodworking machine and a pattern lathe.

The flooring of this shop is of 2-in. x 4-in. lumber, placed on edge on steel joists, with a top flooring of ⅞-in. tongued-and-grooved maple. Where the operator

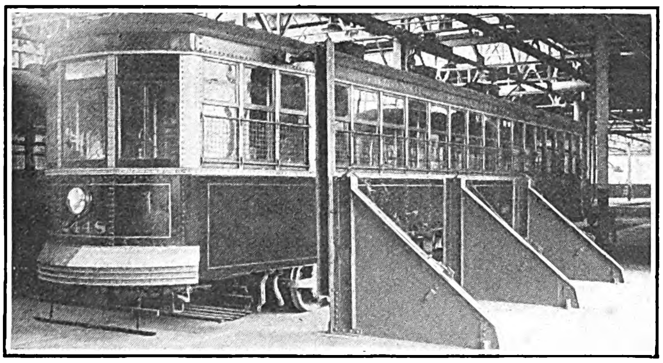


Looking East in the Machine Shop from the Storeroom

stands in front of each machine a slab of mastic flooring is installed to keep him from slipping and falling on the machine.

The machines are placed so that the work progresses in regular order from the rough lumber, taken either from the dry kiln or the lumber rack, through the machines to the cabinet benches and from there direct to the paint shop, adjacent. The wood mill is not walled off from the car body shop in order to insure free movement of material.

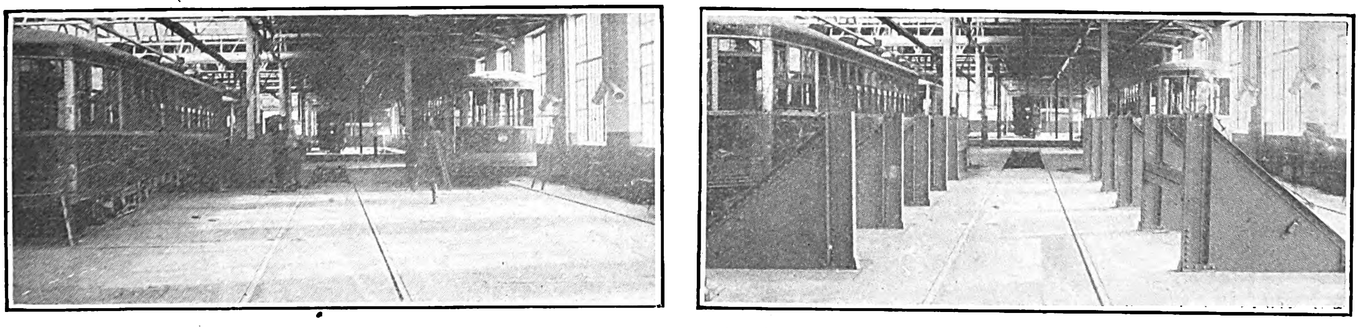
There is a basement underneath the entire wood shop, and all the motors are installed there, directly beneath the machines they drive. This arrangement frees the wood shop entirely from overhead belts and shafting, as may be seen from the illustrations. Each individual motor is controlled by push buttons located on the machine it drives, placed within convenient reach of the operator.



The basement also provides space for the storage of finished car parts, such as sash, doors, molding, etc.

In the wood shop are two small portable jointing machines and two combination rip and cross-cut saws. These are driven by motors, both machine and motor being mounted on a specially designed frame, which permits of the machine being taken to a job to be done on a car body, such as trimming a window sash, instead of this job having to be carried into the woodworking shop.

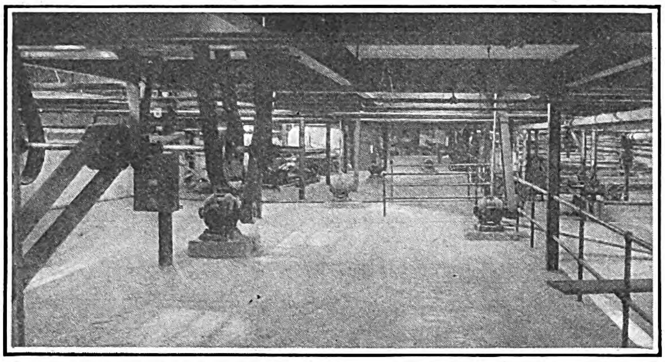
All the machines are supplied with factory box trucks, so that the material can be kept off the floor. Where possible the material is allowed to fall from the table of the machine directly



The Car Straightener Is Located in the Body Shop

At left, the beams are dropped into pockets in the floor. Right, all twelve of the beams are raised in this picture. In practice only such beams are raised as necessary for straightening.

Above, a car in the press being straightened. Note the extension beam bolted to the regular beam to permit straightening the upper part of the car.



This Picture of the Basement Beneath the Woodworking Shop Was Taken Entirely with the Light from the Regular Illuminating System

onto the truck, which can then be moved to the next step in the progress of the work without further handling.

A small separate building has been constructed to the north of the main building to form a dry kiln. This is so arranged that a car loaded with lumber may be run directly into it. It is supplied with steam from the main heating plant.

It is estimated that owing to the layout there will be a saving of at least 35 to 40 per cent in the cost of repair work in this department over what was possible in the old shop, together with a much improved quality of work performed.

### PAINT SHOP EQUIPMENT

The paint shop is located in the northeast portion of the building. It is entirely inclosed, so as to keep it free from dust and dirt, and so that the fumes will not penetrate other parts of the building. It has 13 tracks, each of two-car capacity, two tracks of three-car capacity, and a wash bay with space for four cars, making a total of 36 cars. In addition there is a finishing room 60 ft. x 144 ft.

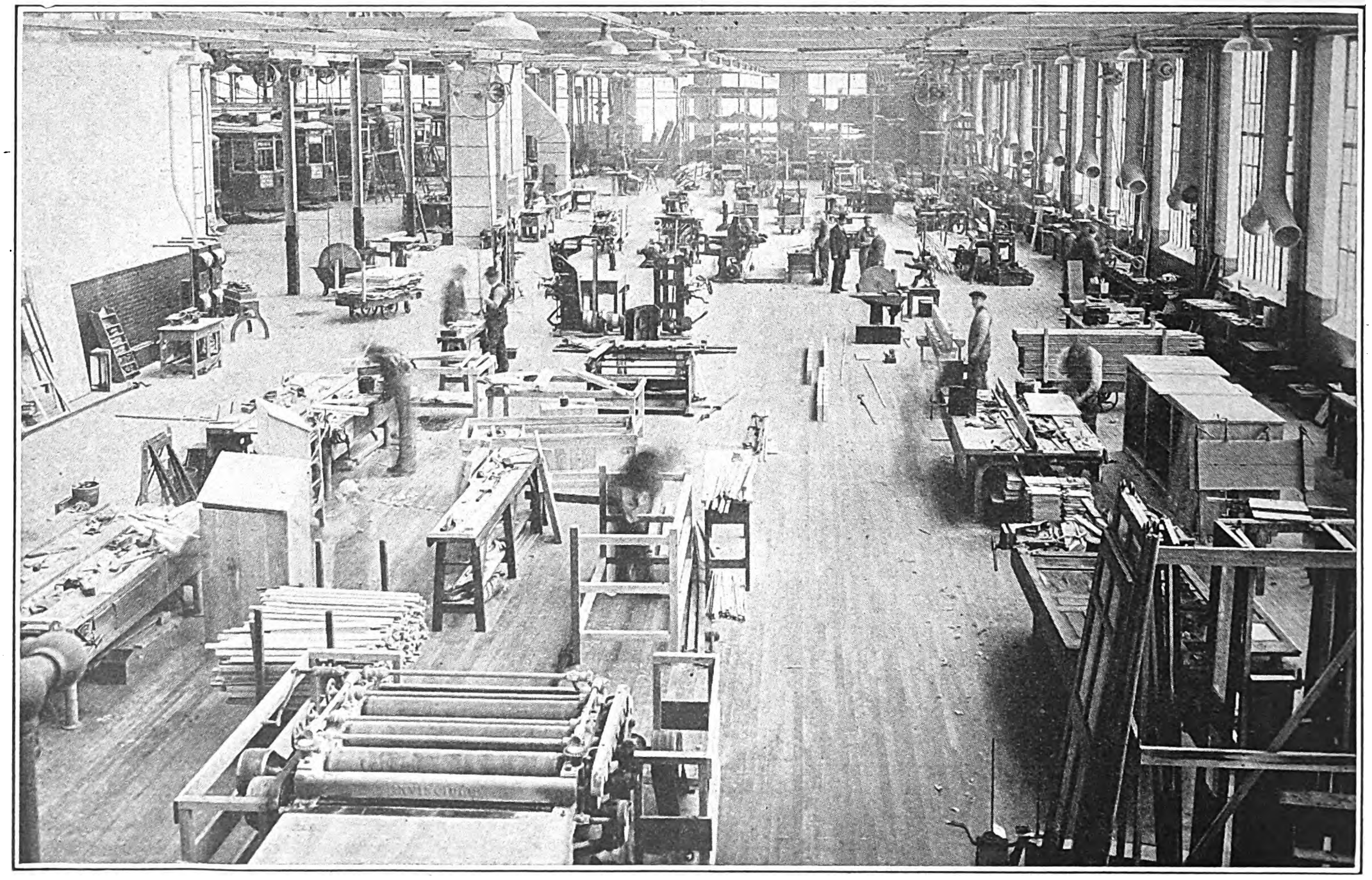
The paint storage is in a separate one-story building immediately north of the paint shop, and connected with it by a covered passageway, which, however, can be closed by a fire door. All paints and supplies are kept in this storeroom, minimizing the fire hazard in the main building.

A complete equipment of adjustable scaffold posts is provided for the convenience of the men while engaged in painting the cars. These consist of 4-in. hollow iron posts set in the concrete floor at regular distances. On each post are two extension arms which slide up and down on the outside, being adjustable for height and counterbalanced by weights inside the post. Planks can then be laid on these extension arms. This equipment is much safer and more convenient than scaffolding ladders.

The finishing room is efficiently located in relation to both the paint shop and the woodworking shop. Sash racks are provided for drying varnished sash, revolving tables for varnishing sash, special benches and easels, and transveyors and racks for transporting sash and car trimmings from the car to the body shop, then to the finishing room and back to the car in the paint shop to be finished.

Toilet, washroom and locker facilities for the men have been provided in balconies located at various places convenient to the various departments.

Immediately east of the armature room is the employees' lunch room, where tables and chairs are provided for the men to serve themselves with lunch. The management has made arrangements for supplying tea, coffee and milk at rates just sufficient to cover the cost.



Looking West in the Woodworking Shop. The Lumber Storage Racks Are in the Background

# Association News & Discussions

## "Move Over, Brother"*

### The Community Safety Movement as It Is Being Worked Out in New England Communities with the Co-operation of the Electric Railways

By Lewis E. MacBrayne
General Manager Massachusetts Safety Council

IN A MASSACHUSETTS city of 125,000 population automobile traffic on one of the main streets on a Saturday night, when the suburban motorists come in to shop, has become so congested that it is necessary to post a traffic officer on duty every hundred feet to keep autos off the street railway tracks. Five lines of trolley cars enter the downtown area through this street, and without traffic control there would be a hopeless blockage. A traffic sergeant moves down the line from time to time, waving his hand, and bidding the motorists "Move over, brother."

In another city, of wider streets and an even greater volume of traffic, I saw a crowd gathered recently about a heavy trolley car and a wrecked automobile. A loquacious colored brother, who had been passing when the collision occurred, told me what had happened. "Dis gemman was drivin' to kingdom come out of de side street, an' he bust into dat car right in its middle," he said. "He was de mos' surprised gemman to see dat 'lectric car dar."

It seems to me that one phase of our present highway problem, as it concerns autos and street cars, is described in those two phrases: "Move over, brother," and "Driving to kingdom come." One group of motorists, with no real intention of adding to the troubles of a fully occupied motorman, is continually cutting in on the trolley, but without causing much personal injury. The other is as frequently shooting out of intersecting streets into highways where there are no traffic men on duty, heading straight for kingdom come, and often narrowly missing arriving there. An analysis of 7,675 auto accidents that have occurred recently in Connecticut cities shows that 650 were collisions with trolley cars; not an unduly large proportion, but important in view of the fact that the street car was the only object in the various types of collisions that was moving over a defined and restricted route.

I need not discuss with you today the particular type of a collision with which you are all familiar. May I, instead, consider the broader problem of how much more acute our highway problem in New England may become, and to what degree we can lessen it as it develops.

I have been serving as a member of the special committee recently appointed by the Governor of Massachusetts to investigate the causes that have resulted in an abnormal increase in highway fatalities within the state since last summer. Considerable evidence presented to us served to lead to the conclusion that we had reached the point of saturation when 500,000 motor vehicles were registered within the state; or, to put it in simple terms, our small state, with its 39 cities and numerous towns, would safely hold only half a million motor vehicles, and that beyond that number we were creating so many potential hazards that we must be prepared to pay a higher price, in life and limb. The end of April, however, appeared to upset this theory, for the increase in fatalities that had been going on for four months was checked with a reduction of five deaths over the previous April, and for no apparent reason than the widespread publicity given to the daily sessions of the committee, and several organized safety drives on in various cities of the state. Up to the present time in May the month records a reduction of ten deaths as compared with the same period a year ago, and it is apparent that the human factor is still the important element in the problem.

Now just what are we to conclude from this? A medical examiner of one of our counties, writing to me yesterday, said that he believed that our spasmodic safety campaigns were all wrong, since the public returned to its careless ways soon after these intensive periods were over. He urged that we develop some method of carrying on a permanent campaign of education. I partly agree with him, because I have been seeking data, for the past two years, to determine just how long the respect of the law, or the good intentions of the individual—you may take it either way—survives the community campaign. In Lawrence, where the Massachusetts Safety Council supervised a safety campaign last October, our real dividends were checked up in the 30 days that followed. There were only six serious accidents as against 16 for the same period in the previous year. There were no fatalities as against six for the corresponding period. A 30-day safety campaign put on in an industrial plant in Buffalo last October obtained only moderate results at the time, but there has been a steady improvement ever since, and in six months a reduction of 66 per cent in the number of accidents was recorded.

My own organization is now receiving calls for service of a type that perhaps indicates the trend of this community safety work. The city of Somerville had the unfortunate experience last year of killing ten children to four adults on the highway. The proportion should have been seven adults to six children. When we gave publicity to this fact the city, at first through its Rotary Club, and later through its Mayor and other city officials, requested us to look into local conditions and suggest a remedy. We found one or two abnormal conditions, such as a police force with no adequately trained traffic squad, due to local financial reasons, but speaking generally it was a situation existing in several other cities; an increasing stream of intercity traffic, many street cars contributing to the obstructed view, mothers of young children not yet conscious of the abnormal highway conditions.

Somerville has now organized, not for a special safety drive, but for a campaign to extend throughout the season. Every civic organization is represented upon the general committee. Local speakers are being trained for safety talks. Meetings with safety films have been held in all the schools. A series of articles, discussing all phases of the accident problem, is being prepared for the press. The whole city will eventually concern itself with its own safety.

You may reasonably ask me, at this point, what has all this to do with the subject of my paper, "Move Over, Brother." Well, just how are you going to move Henry Ford's mobile army —not to mention the several other makes—from your car tracks? The motorman cannot verbally swat each one, nor can the superintendent of the division personally police the entire system. It must be done by creating enough public opinion to cover the entire highway problem. It must therefore be included in the community safety program.

We are supervising such a program in Chelsea during the present week. The city is about to observe its 300th anniversary, but its highway and fire hazards are such, and its population is composed of so many racial groups, that the Mayor, an energetic young man, was unwilling to open the celebration before his city had put itself in the frame of mind to think and act safety. The following program was accordingly worked out for him. Last Friday a printed message, illustrated with four street hazards, among them the street car, was sent into 10,000 homes. On Saturday, at seven theater performances, 7,200 children saw safety reels and were told how to cross a street safely, with an emphasis upon the danger of running in front of the street car, because of the fast moving auto that it might conceal. On Sunday the clergymen all talked safety, and on Monday we began a series of four-minute talks in the theaters, one being devoted to the motorists' place on the highway. Other features included daily safety articles in the press and the use of 800 posters with the slogan, "Motorists, Slow Down."

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*Paper presented before New England Street Railway Club, Boston, May 22, 1924.

When such a program is on it is sometimes possible to include a street railway man as a four-minute speaker. At Lawrence we found a motorman who developed a telling talk in the course of the week. I may remark here that we furnish an outline for every talk scheduled, no matter what its topic, in order that the psychology of its presentation may be correct, and certain important facts be stressed. Nature has gifted very few of us who are engaged in daily tasks with the power of ready expression, and yet the man in uniform—traffic officer, fire chief or motorman—has a quick appeal to an audience when we have taught him how to present his story.

I have been watching with interest the effort of one of our street railway systems in Massachusetts to sell its service to the public over its own dashboard. We were advised during midwinter that it was cheaper to put up the auto and use the street car. We were informed that the trolley was convenient for shopping. All this is legitimate, and suggests to me that it might be possible, if collisions with motor vehicles still increase, to get over our "Move over, brother," plea in a like manner. What would be the effect on the average operator of an auto to read, as he approached a street car, "Motorists, please give this car the right of way on its own rails," or "Auto drivers can help this street car reduce collisions." In the first place, it would establish in the public mind the fact that the street railway company was concerned over the highway problem, and anxious to gain co-operation in solving it. Public opinion often develops along such a lead as this. In the second place, it would put the careless motorist in the position of being reckless in the face of a protest.

The theory has been advanced that our more conservative citizens, the people of good judgment, were all included in the first ten million automobiles purchased in the United States, and that the last five million have given us a larger proportion of inexperienced and careless operators. My own idea is that we still have only about 4 per cent of drivers who ought to be ruled off the highways, but that the increasing total of motorists in the country automatically increases this group so that it becomes more evident and more noticeable. The point of automobile saturation for the United States has been set as high as 20,000,000, and for Massachusetts as high as 1,000,000. Nobody knows that it really is, and the industrial and agricultural prosperity of our people is undoubtedly a factor.

We have been killing 1,000 more persons annually for each million new motor vehicles put into commission. We have been increasing the number of collisions involving automobiles. But if the human factor is still the controlling one, then our task is to educate the individual in the control of speed and the elimination of fool chances. Too many drivers, many of them young and untaught in the value of human life, are driving for kingdom come. One can almost imagine them, hurled into eternity, picking up a new and joyous equipment of wings, and speeding on through the realms of space, cutting in and out on other angels, and eventually duplicating all the collisions that they had on earth.

# Electric Locomotives Discussed at A.S.M.E. Meeting

### Tendencies in Recent Designs Are Given by N. W. Storer and A. H. Armstrong—Reasons for the Adoption of Various Types of Drive and Arrangement of Mechanical Parts Are Emphasized

TWO papers on the subject of developments in electric locomotives were presented at the spring meeting of the American Society of Mechanical Engineers held at Cleveland, Ohio, May 29. One was by N. W. Storer, general engineer Westinghouse Electric & Manufacturing Company, the other by A. H. Armstrong, railway engineer General Electric Company.

Brief descriptions of some of the recent Westinghouse electric locomotives were given by Mr. Storer. These included the locomotives for the Paulista Railway of Brazil, the Chilean State Railways, the New York, New Haven & Hartford, the Norfolk & Western, the Virginian and the Pennsylvania. These locomotives have been described in various issues of the ELECTRIC RAILWAY JOURNAL. The principal features of the design were tabulated by Mr. Storer. They are given in the table on page 900.

Another type of locomotive which has been discussed more or less in the last few months is the motor-generator type, which it was announced some time ago was being built by the Ford Motor Company for the electrification of the Detroit & Ironton Railway. This locomotive, Mr. Storer said, will operate under a 22,000-volt, single-phase, 25-cycle trolley, but will have an oil-cooled transformer to reduce the voltage to a low value for a synchro-

DATA ON GENERAL ELECTRIC COMPANY ELECTRIC LOCOMOTIVES

| | Gearless Passenger | | | | | | | | Geared Passenger | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| General Data | N. Y. C. Type "S" (122 ton) | | N. Y. C. Type "T" (133 ton) | | C. M. & St. P. Pass. (260 ton) | | Paris-Orleans Pass. | | Paulista Pass. (120 ton) | | B. A. & P. Pass. (80 ton) | |
| Diameter of drivers | 44 in. | | 36 in. | | 44 in. | | 47.2 in. | | 42 in. | | 46 in. | |
| Number of driving axles | 4 | | 8 | | 12 | | 6 | | 4 | | 4 | |
| Diameter of guiding wheels | 36½ in. | | ..... | | 36 in. | | 36 in. | | 36 in. | | ..... | |
| Number of guiding axles | 4 | | ..... | | 2 | | 4 | | 4 | | ... | |
| Total wheel base | 36 ft. 0 in. | | 46 ft. 5 in. | | 67 ft. 0 in. | | 53 ft. 6 in. | | 46 ft. 0 in. | | 26 ft. 0 in. | |
| Width over all | | | | | | | | | | | | |
| Length inside knuckles | 43 ft. ½ in. | | 56 ft. 10 in. | | 76 ft. 0 in. | | 62 ft. 5 in. (over buffers) | | 55 ft. 0 in. (over buffers) | | 37 ft. 4 in. | |
| Height over trolley, locked down | 15 ft. 1 in. | | 15 ft. 1 in. | | 16 ft. 8 in. | | 12 ft. 7 in. | | 14 ft. 3 in. | | 15 ft. 6 in. | |
| Ratings | 1 Hr. | Cont. | 1 Hr. | Cont. | 1 Hr. | Cont. | 1 Hr. | Cont. | 1 Hr. | Cont. | 1 Hr. | Cont. |
| Amperes | 2,300 | 1,060 | 3,000 | 2,480 | 990 | 860 | 1,200 | 1,275 | 460 | 440 | 392 | 370 |
| Tractive effort, lb. | 15,200 | 4,900 | 15,100 | 11,500 | 48,500 | 40,800 | 12,750<br>11,620 | 13,650 F.F.*<br>12,600 S. F.* | 14,750 | 13,900 | 16,800 | 15,600 |
| Coefficient of adhesion—per cent | 10.5 | 3.3 | 5.7 | 4.34 | 10.59 | 8.9 | 7.54<br>6.9 | 8.1 F.F.*<br>7.5 S.F.* | 9.2 | 8.7 | 10.4 | 9.7 |
| Speed at full rated voltage | 41.8 | 60.6 | 54.0 | 59.0 | 27.1 | 28.7 | 58.0<br>64.0 | 56.5 F.F.*<br>62.8 S.F.* | 42.8 | 43.4 | 25.4 | 25.0 |
| Horsepower-driver | 1,691 | 792 | 2,180 | 1,810 | 3,500 | 3,300 | 1,940<br>1,985 | 2,060 F.F.*<br>2,100 S.F.* | 1,680 | 1,608 | 1,140 | 1,040 |
| Horsepower-output | | | | | | | | | | | | |
| Maximum safe speed, m.p.h. | 80 | | 85 | | 90 | | ....... | | 56 | | 45 | |
| Tractive effort—25 per cent adhesion | 37,125 | | 66,250 | | 114,450 | | 42,300 | | 40,000 | | 40,250 | |
| Weights | | | | | | | | | | | | |
| Total | 244,500 | | 265,000 | | 521,200 | | 240,000 | | 240,000 | | 161,000 | |
| On drivers | 148,500 | | 265,000 | | 457,800 | | 169,000 | | 160,000 | | 161,000 | |
| Per driving axle | 37,125 | | 33,125 | | 38,150 | | 28,170 | | 40,000 | | 40,250 | |
| Mechanical | 184,500 | | 177,000 | | 286,550 | | 137,000 | | 160,300 | | 101,000 | |
| Electrical equipment | 60,000 | | 88,000 | | 234,650 | | 103,000 | | 79,700 | | 60,000 | |
| Track gage | 4 ft. 8½ in. | | 4 ft. 8½ in. | | 4 ft. 8½ in. | | 4 ft. 9 in. | | 5 ft. 3 in. | | 4 ft. 8½ in. | |
| Motors | | | | | | | | | | | | |
| Number | 4 | | 8 | | 12 | | 6 | | 4 | | 4 | |
| Type | GE-84-A | | GE-91-A | | GE-100 | | GE-101-A | | GE-267-A | | GE-229-A | |
| Rated voltage | 600 | | 600 | | 1,000/3,000 | | 750/1,500 | | 1,500/3,000 | | 1,200/2,400 | |
| Method of drive | Direct | | Direct | | Direct | | Direct | | Twin Gear, Springs | | Twin Gear, Sol | |
| Gear ratio | Gearless | | Gearless | | Gearless | | Gearless | | 70/30 = 2.33 | | 80/25 = 3.2 | |
| Ventilation | Natural | | Forced | | Forced | | Forced | | Fan on Arm. | | Forced | |
| Regenerative control | No | | No | | Yes | | No | | Yes | | No | |

*F.F.-Full field; S.F.-Short field.

nous motor-generator furnishing direct current for motors mounted on the axles. The reason for reviving the motor-generator idea, which was proposed a good many years ago, is that recent developments have made it possible to design a motor-generator set of sufficient capacity for heavy locomotives without excessive weight or dimensions. The control of this type of locomotive is ideal, as all of the motors may be connected permanently in parallel and supplied with current from the generator at any desired voltage. The control of the motor fields will permit the locomotive to develop its full horsepower rating over a wide range in speed and thus to secure one of the excellent characteristics of the steam locomotive.

While it may at first appear that a motor-generator type of locomotive is simply a direct-current locomotive with transformer and motor-generator set added, such is not the case, as the motors will be smaller and more rugged than high-voltage direct-current motors, since they will be wound for low voltage and operated on an ungrounded circuit which is individual to the locomotive. This reduces the amount of control apparatus very greatly and thus not only decreases the weight but also the cost of the equipment. While none of these locomotives has been completed, the speaker holds that this type will have an important place on alternating-current railways.

In all the locomotives described there are three types of driving motors and three distinct types of drive, Mr. Storer pointed out. In general, it may be stated that the choice of drive and the wheel arrangement, which together practically determine the entire design, will depend, first, on the class of service, i.e., whether it is freight or passenger, slow, medium or fast, light or heavy, the permissible wheel loading, track alignment, etc.; second, on the kind of driving motor that is to be used, i.e., whether direct-current, single-phase commutator type, or three-phase induction motor, and, third, on the judgment of the engineers who direct the design.

It is taken for granted that every one is striving to secure a locomotive that will in the last analysis show the greatest economy in operation, i.e., one which will give the lowest total cost per ton-mile. The assumption that a locomotive with maximum power concentrated in a single unit on the minimum number of driving wheels will produce this result, while true in the case of the steam locomotive, may be questioned and requires a specific analysis in each case for the electric. One of the principal reasons for the use of the maximum size of locomotive with a steam engine, the cost of engine crews, has no application at all on the electric. By the use of multiple-unit control it is everyday practice for one crew to handle as many motive-power units as can be desired at one point in the train. Where a very heavy locomotive is required, the capacity of motive-power units should therefore be selected from the points of view of convenience, first cost and operating cost, with due consideration to the effect on track and bridges.

After pointing out some of the points to be settled in the design, the author stated that he appreciates that there are not yet sufficient data available to make anything more than a few general statements in regard to these points, but he feels that the subject is one of such importance that it should be very carefully studied. The very active interest that is now aroused in railway electrification will naturally result in further engineering analyses of this subject.

The tendency in heavy locomotive design for freight use seems to be toward the use of maximum axle loadings and transmission by gears, jackshaft and side rod from motor to axles, together with the combination of the cab with the side frames. There is also a noticeable tendency toward the use of the individual drive with spring-mounted motors for higher speed locomotives of large capacity. For locomotives with small capacity and axle loading with direct-current motors, the axle-hung motor certainly has the field.

### FLEXIBILITY OF ELECTRIC DRIVE PERMITS RADICAL DEPARTURES

In discussing the trend of electric locomotive design, Mr. Armstrong stated that the electric motor, with its great flexibility, permits a radical departure from steam engine practice in both the design and operating characteristics of the locomotive. In fact, the electrical engineer is embarrassed in his attempt to arrive at a standard type of electric locomotive for any class of service because of the variety of designs available, any one of which may be successful in operation. The speaker gave illustrations from the experience of his company, describing a considerable number of designs. The principal design features were summarized in a table, which is presented below.

With regard to electric locomotive rating, the speaker stated that a study of many train dispatchers' sheets, showing trailing and engine tonnage actually hauled by locomotives of different types, indicate that the total gross tractive effort exerted at the driver rims agrees approximately to 18 per cent of the total driver weight. Starting effort may reach as high as 25 per cent or even 30 per cent under favorable conditions. Mr. Armstrong presented a table showing that the continuous tractive effort of a number of modern electric freight locomotives averages 14.06 per cent of the driver weight, that of electric passenger locomotives averages 7.35 per cent and of electric switching locomotives 9.53 per cent.

With regard to wheel arrangement, the speaker concluded that this is apparently not a matter of much concern in its effect on riding qualities of the electric locomotive for speeds below 50 m.p.h., i.e., the field of the freight locomotive. For the higher speeds incident to passenger train operation a four-truck construction has found favor on account of its minimum effect upon track and flange wear.

There are, apparently, two broad lines being followed in the development of the electric locomotive: First, direct application of the motor to the driving axle, and, second, the interposition of jack shaft and side rods. Geared axle drive for lower speeds and both geared axle and gearless drive for higher speeds have been so successful in meeting every railroad requirement that they may be regarded as accepted standards with direct-current motor equipment, Mr. Armstrong said. The bipolar gearless motor drive is restricted to direct-current motors, but geared axle drive is available to both direct-current and alternating-current motors, provided the axle weight in the latter case does not much exceed 40,000 lb.

Geared quill and side rod drive are favored for single-phase motor application to heavy duty locomotives, as providing the additional space required for the best design of such motors. The

FOR HEAVY SERVICE

| Geared Freight | | | | | | | | | | Geared Side Rod | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C. M. & St. P.<br>Freight<br>(288 ton) | | Mexican<br>Freight<br>(150·ton) | | Paulista<br>Freight<br>(100 ton) | | Spanish<br>Northern<br>Freight | | B. A. & P.<br>Freight<br>(81 ton) | | N. Y., N. H. & H.<br>(Bull Moose)<br>(125 ton) | |
| 52 in. | | 46 in. | | 42 in. | | 39.37 in. | | 46 in. | | 54 in. | |
| 8 | | 6 | | 4 | | 6 | | 4 | | 4 | |
| 36 in. | | ...... | | ...... | | ........ | | ...... | | 36 in. | |
| 4 | | ...... | | ...... | | ........ | | ...... | | 4 | |
| 102 ft. 8 in. | | 40 ft. 6 in. | | 26 ft. 8 in. | | 35 ft. 0 in. | | 26 ft. 0 in. | | 54 ft. 10 in.<br>10 ft. | |
| 112 ft. 0 in. | | 52 ft. 11 in. | | 39 ft. 2 in.<br>(over buffers) | | 46 ft. 0 in.<br>(over buffers) | | 37 ft. 4 in. | | 62 ft. 0 in. | |
| 16 ft. 8 in. | | 15 ft. 2 in. | | 14 ft. 3 in. | | 13 ft. 5 in. | | 15 ft. 6 in. | | 14 ft. 5 in. | |
| 1 Hr. | Cont. | 1 Hr. | Cont. | 1 Hr. | Cont. | 1 Hr. | Cont. | 1 Hr. | Cont. | 1 Hr. | Cont. |
| 960 | 920 | 750 | 690 F.F.*<br>690 S.F.* | 460 | 440 | 440 | 430 | 392 | 370 | 1,800 | 1,600 |
| 84,500 | 79,500 | 51,600 | 46,200 F.F.*<br>33,720 S.F.* | 28,900 | 27,300 | 27,100 | 26,500 | 25,600 | 23,600 | 27,000 | 22,200 |
| 18.8 | 17.65 | 16.7 | 14.95<br>10.9 | 14.45 | 13.65 | 15.75 | 14.8 | 15.8 | 14.6 | 13.9 | 11.5 |
| 15.25 | 15.4 | 19.9 | 20.45<br>28.0 | 21.8 | 22.1 | 21.6 | 21.9 | 16.6 | 17.0 | 23.0 | 26.4 |
| 3,440 | 3,280 | 2,740 | 2,520<br>2,520 | 1,680 | 1,610 | 1,550 | 1,550 | 1,135 | 1,070 | 1,650 | 1,560 |
| 35 | | ...... | | 31.1 | | 34 | | 30 | | 45 | |
| 112,500 | | 77,250 | | 50,000 | | 44,800 | | 40,500 | | 48,500 | |
| 576,000 | | 309,000 | | 200,000 | | 179,000 | | 162,000 | | 291,000 | |
| 450,000 | | 309,000 | | 200,000 | | 179,000 | | 162,000 | | 194,000 | |
| 56,250 | | 51,500 | | 50,000 | | 29,830 | | 40,500 | | 48,500 | |
| 329,000 | | 174,000 | | 120,300 | | 95,000 | | 102,000 | | 172,000 | |
| 247,000 | | 135,000 | | 79,700 | | 84,000 | | 60,000 | | 119,000 | |
| 4 ft. 8½ in. | | 4 ft. 8½ in. | | 5 ft. 3 in. | | 5 ft. 6 in. | | 4 ft. 8½ in. | | 4 ft. 8½ in | |
| 8 | | 6 | | 4 | | 6 | | 4 | | 4 | |
| GE-253-A | | GE-278-A | | GE-267-A | | GE-255-B | | GE-229-A | | GEA-614 | |
| 1,500/3,000 | | 1,500/3,000 | | 1,500/3,000 | | 1,000/3,000 | | 1,200/2,400 | | | |
| Twin Gear, Springs | | Twin Gear, Springs | | Twin Gear, Springs | | Single Gear, Solid | | Twin Gear, Solid | | Geared, Side Rod | |
| 82/18 = 4.55 | | 90/18 = 5.0 | | 82/18 = 4.55 | | 72/18 = 4 | | 87/18 = 4.83 | | 71/35 = 2.03 | |
| Forced | | Forced | | Fan on Arm. | | Forced | | Forced | | Forced | |
| Yes | | Yes | | Yes | | Yes | | No | | No | |

latter construction, especially, apparently finds its best expression in very high driving axle weights and long rigid driving wheel base, thus possibly restricting the application of such locomotives to roadbeds most favorable for their operation. These same forms of construction are also open to direct-current motor applications, but apparently find little favor as compared to the simpler and more efficient direct axle drive which is employed in nearly every locomotive equipped with direct-current motors.

## Midwest Association Program

THE following program has been announced for the annual meeting of the Midwest Electric Railway Association to be held in the Fontenelle Hotel, Omaha, Neb., on June 11 and 12:

### JUNE 11

**Morning Session**

The Future of City Transportation.

"Traffic and Congestion," by R. J. Lockwood, St. Louis, Mo.

"The Economics of City Transportation," by E. R. Stenger, Denver, Col.

Open discussion on "The Bus and Its Place."

**Afternoon Session**

"Indirect Taxes and the Car Ride," by S. B. Irelan, St. Joseph, Mo.

"Service and the Man Who Sells It," by F. G. Buffe, Kansas City, Mo.

### JUNE 12

**Morning Session**

"The Interurban Railway—Its Past, Present and Future," by Bruce Cameron, Pittsburg, Kan.

DATA FOR NEW WESTINGHOUSE ELECTRIC LOCOMOTIVES

| Railroad | | Number in Service | Class of Service | Contact Voltage | Conductor Type | Type of Loco. | Class. by Wheels | Driving Wheels No. | Driving Wheels Diam. | Truck Wheels No. | Truck Wheels Diam. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Paulista Railway | 1 | 2 | Passenger | 3,000 | Catenary | d.c. | 2–4 + 4–2 | 8 | 63 in. | 4 | 36 in. |
| | 2 | 2 | Freight | 3,000 | Catenary | d.c. | 0–6 + 6–0 | 12 | 40 in. | .. | ...... |
| Chilean State Railways | 1 | 6 | Express passenger | 3,000 | Catenary | d.c. | 2–6 + 6–2 | 12 | 42 in. | 4 | 30 in. |
| | 2 | 11 | Local passenger | 3,000 | Catenary | d.c. | 0–4 + 4–0 | 8 | 42 in. | 0 | ...... |
| | 3 | 15 | Freight | 3,000 | Catenary | d.c. | 0–6 + 6–0 | 12 | 42 in. | 0 | ...... |
| | 4 | 7 | Switcher | 3,000 | Catenary | d.c. | 0–4 + 4–0 | 8 | 42 in. | 0 | ...... |
| N. Y., N. H. & H. R. R. | | 12 | Passenger | 600<br>11,000 | d.c. 3d rail<br>a.c. Catenary | d.c. &<br>a.c. | 2–6–2 + 2–6–2 | 12 | 63 in. | 8 | 36 in. |
| Norfolk & Western | | 8 Motive Power Units | Freight | 11,000 | Catenary | a.c. | 2–8–2 | 8 | 62 in. | 4 | 33 in. |
| The Virginian | | 36 Motive Power Units | Freight | 22,000<br>11,000 | Catenary | a.c. | 2–8–2 | 8 | 62 in. | 4 | 33 in. |
| Pennsylvania | 1 | 2 | Passenger | 650 | 3d rail | d.c. | 2–8–2 | 8 | 80 in. | 4 | 33 in. |
| | 2 | 1 | Freight | 11,000 | Catenary | a.c. | 2–8–2 | 8 | 80 in. | 4 | 33 in. |

| Railroad | | Articulated Trucks | Wheelbase Rigid | Wheelbase Total | Weight in Pounds: Total Road Weight | On Drivers | Per Driving Axle | Mech. Parts | Equipment[1] |
|---|---|---|---|---|---|---|---|---|---|
| Paulista Railway | 1 | Yes | 8 ft. 4 in. | 41 ft. 2 in. | 283,800 | 205,800 | 51,450 | 165,400 | 118,400 |
| | 2 | Yes | 14 ft. 0 in. | 37 ft. 0 in. | 234,300 | 234,300 | 39,050 | 144,050 | 90,250 |
| Chilean State Railways | 1 | Yes | 14 ft. 5 in. | 48 ft. 4 in. | 259,800 | 210,000 | 35,000 | 153,966 | 105,834 |
| | 2 | Yes | 8 ft. 4 in. | 26 ft. 0 in. | 160,000 | 160,000 | 40,000 | 93,000 | 67,000 |
| | 3 | Yes | 13 ft. 9 in. | 37 ft. 0 in. | 230,000 | 230,000 | 38,333 | 138,400 | 91,600 |
| | 4 | No | 8 ft. 6 in. | 27 ft. 4 in. | 137,000 | 137,000 | 34,250 | 80,900 | 56,100 |
| N. Y., N. H. & H. R. R. | | Yes | 14 ft. 3 in. | 59 ft. 6 in. | 358,000 | 240,000 | 40,000 | 175,200 | 182,800 |
| Norfolk & Western | | No | 16 ft. 6 in. | 37 ft. 6 in. | 414,000 | 300,000 | 75,000 | 251,500 | 162,500 |
| The Virginian | | No | 16 ft. 6 in. | 37 ft. 6 in. | 414,000 | 300,000 | 75,000 | ....... | ...... |
| Pennsylvania | 1 | No | 22 ft. 3 in. | 54 ft. 11 in. | approx.<br>400,000 | 300,000 | 75,000 | 225,100 | 174,900 |
| | 2 | No | 22 ft. 3 in. | 54 ft. 11 in. | 408,000 | 300,000 | 75,000 | 225,100 | 182,900 |

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[1] Includes sand, air brakes, etc.

| Railroad | | Dimensions: Length Over All | Width Over All | Height Trolley Down | Regen. Control | Motors: No. | Method of Drive | Gear Ratio |
|---|---|---|---|---|---|---|---|---|
| Paulista Railway | 1 | 52 ft. 11 in. | 10 ft. 7 in. | 14 ft. 10 in. | Yes | 4 Twin | Geared quill | 28 : 86 |
| | 2 | 50 ft. 2 in. | 10 ft. 6.5 in. | 14 ft. 10 in. | Yes | 6 | Geared | 16 : 63 |
| Chilean State Railways | 1 | 58 ft. 5 in. | 10 ft. 6.75 in. | 14 ft. $4\frac{7}{16}$ in. | Yes | 6 | Flexible gear | 21 : 56 |
| | 2 | 38 ft. 9.5 in. | 10 ft. 7 in. | 14 ft. $2\frac{3}{16}$ in. | No | 4 | Flexible gear | 21 : 56 |
| | 3 | 49 ft. 9.5 in. | 10 ft. 6.75 in. | 14 ft. $4\frac{7}{16}$ in. | Yes | 6 | Flexible gear | 15 : 63 |
| | 4 | 40 ft. 0 in. | 10 ft. 6.75 in. | 14 ft. $2\frac{3}{16}$ in. | No | 4 | Gear | 16 : 63 |
| N. Y., N. H. & H. R. R. | | 68 ft. 6 in. | 10 ft. 2.5 in. | Over d.c. Trolley Down<br>14 ft. 9½ in. | No | 6 Twin | Geared quill | 25 : 89 |
| Norfolk & Western | | 48 ft. 7 in. | 10 ft. 5 in. | 16 ft. 0 in. | Yes | 2 | Flexible geared jack shaft and side rod | 21 : 100 |
| The Virginian | | ........... | 10 ft. 5 in. | 16 ft. 0 in. | Yes | 2 | Flexible geared jack shaft and side rod | ....... |
| Pennsylvania | 1 | 68 ft. 2.5 in. | 10 ft. 3 in. | 15 ft. 6 in. | No | 4 | Flexible gear and side rod | 50 : 98 |
| | 2 | 68 ft. 2.5 in. | 10 ft. 3 in. | 15 ft. 6 in. | No | 4 | Flexible gear and side rod | 30 : 118 |

| Railroad | | Tractive Effort in Pounds: One-Hour Rating F. V. | Per Cent Coefficient of Adhesion | Continuous Rating F. V. | Per Cent Coefficient of Adhesion | Starting |
|---|---|---|---|---|---|---|
| Paulista Railway | 1 | 20,960 | 10.0 | 14,240 | 6.9 | 54,400 maximum |
| | 2 | 32,400 | 13.8 | 21,600 | 9.2 | 77,310 33 per cent adhesion |
| Chilean State Railways | 1 | 25,800 | 12.3 | 19,800 | 9.4 | 70,800 maximum |
| | 2 | 17,200 | 10.8 | 13,200 | 8.3 | 47,200 maximum |
| | 3 | 31,200 | 13.6 | 24,360 | 10.6 | 75,900 33 per cent adhesion |
| | 4[2] | 23,000[2] | 16.8 | 11,000[2] | 8.0 | 45,210 33 per cent adhesion |
| N. Y., N. H. & H. R. R. | | 23,160 | 9.66 | 16,200 | 6.66 | 52,500 maximum |
| Norfolk & Western | 8 Poles | 108,000 | 18.0 | 90,000 | 15.0 | 185,000 maximum |
| (2 M.P.U.) | 4 Poles | 63,000 | 10.5 | 52,500 | 8.75 | 110,000 maximum |
| The Virginian | | ....... | ..... | ....... | ..... | .................... |
| Pennsylvania | 1 | 44,000 | 15.47 | 36,000 | 12.64 | 86,000 maximum |
| | 2 | 59,000 | 19.72 | 50,000 | 16.66 | 100,000 33 per cent adhesion |

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[2] Self-ventilated. F.V. = force ventilated.

| Railroad | | Speed, Miles per Hour: One-Hour Rating | Continuous Rating | Maximum Safe | Horsepower of Locomotive: One-Hour Rating F.V.[3] | Continuous Rating F.V.[3] | Builder of Mechanical Parts |
|---|---|---|---|---|---|---|---|
| Paulista Railway | 1 | 42.8 | 47.2 | 65 | 2400 | 1800 | Baldwin |
| | 2 | 20.8 | 23.4 | 42 | 1800 | 1350 | |
| Chilean State Railways | 1 | 36.0 | 39.75 | 63 | 2460 | 2040 | Baldwin |
| | 2 | 36.0 | 39.75 | 56 | 1640 | 1360 | |
| | 3 | 21.5 | 23.0 | 44 | 1800 | 1500 | |
| | 4 | 10.5 | 12.75 | 35 | 640 | 384 | |
| N. Y., N. H. & H. R. R. | | 32.6 | 38.4 | 77 | 2016 | 1656 | Baldwin |
| Norfolk & Western | 8 P | 14.10 | 14.20 | 38 | 4060 | 3400 | American |
| (2 M.P.U.) | 4 P. | 28.30 | 28.40 | .. | 4750 | 4000 | |
| The Virginian | | ..... | ..... | .. | 4060 | 3400 | American |
| | | ..... | ..... | .. | 4750 | 4000 | |
| Pennsylvania | 1 | 35.9 | 37.8 | 70 | 4100 | 3630 | Penna. R. R |
| | 2 | 21.00 | 23.0 | 35 | 3300 | 3070 | |

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[3] F.V. = force ventilated.

"Bringing the Latest and Best to the Railway Men," by R. F. Carbutt, New York.

On the evening of June 11 those attending will be guests of the Omaha & Council Bluffs Street Railway at a dinner and entertainment. A banquet will be held at the Fontenelle Hotel on the night of June 12. The speaker is to be H. G. Taylor, who is a member of the Nebraska State Railway Commission and also president National Association of Railway and Utility Commissioners.

# American Association News

## Get Ready for the Railway Exhibit

By Fred C. J. Dell

Director of Exhibits American Electric Railway Association, New York

APPLICATIONS for exhibit space and diagram of the space layout on Young's Million Dollar Pier for the forty-third annual convention of the association went out from association headquarters on June 2 by registered mail. The date limit set for the return of space requests is June 30. All applications received up to and including June 30 will be given preference as far as possible in priority of receipt. All applications that arrive after June 30 will be allotted space by the director of exhibits in the order in which they are received.

Now is the time for manufacturers to begin to plan their displays in detail. There were instances at the last convention where companies were assigned certain spaces and a month prior to the opening of the convention these same companies wanted additional space adjacent to that already assigned. Needless to say they were disappointed. Other companies were late in getting applications in, with the result that they had no choice whatever in the matter of space location.

Each year the convention has grown in size, and it is interesting to note the following figures from the attendance standpoint as well as from the number of square feet of exhibition space occupied by manufacturers for actual display purposes:

| Year | Convention Location | Total Registration | Square Feet of Space Sold |
|---|---|---|---|
| 1916 | Atlantic City | 3,271 | 57,392 |
| 1917 | New York | Conference only | No exhibit |
| 1918 | New York | Conference only | No exhibit |
| 1919 | Atlantic City | 3,166 | 62,219 |
| 1920 | Atlantic City | 3,300 | 59,529 |
| 1921 | Atlantic City | 1,189 | No exhibit |
| 1922 | Chicago | 4,200 | 61,895 |
| 1923 | Atlantic City | 4,404 | 75,681 |

In a survey made by various members of the committee on convention location earlier in the year the preference expressed was decidedly for Atlantic City this year and with exhibits. In the first issue of the ELECTRIC RAILWAY JOURNAL this year "a great year for the electric railways" was predicted, and from actual observation during the first quarter the prophecy seems to be running about true to form. Manufacturers will again have the opportunity to show what they have been accomplishing in the way of new things for the benefit of the industry.

The maintenance show in Chicago last March had on display over 100 new devices and products—a great record for manufacturers who in the period of one year could demonstrate 100 new things which had been perfected and patented for the safety, economy and better operation of the steam roads. We wonder what will be the answer of the manufacturers of material for electric properties. Will they equal this record?

The question will be answered next October, and in the meantime, we say begin right now, Mr. Manufacturer, to plan your display; get your space applications in to association headquarters on or before June 30. The exhibit committee will meet early in July to make the initial space assignment, and for the good of the industry and for the advancement of the art it is your duty to show what you have to the 4,000 or more delegates who will go to Atlantic City next October prepared to see, study and take home with them new thoughts and ideas that will make for better transportation.

From May 19 to 22, inclusive, the first exhibit of the National Automotive Service convention was held in Detroit, at which there was an exhibit of 103 automotive maintenance equipment manufacturers. This convention was held under the auspices of the National Automobile Chamber of Commerce in co-operation with the Society of Automotive Engineers, Motor and Accessory Manufacturers' Association, National Automobile Dealers' Association, Automotive Equipment Association and the Service Equipment Association.

It was the first exhibition on a comparatively large scale ever held and the manufacturers' exhibits included portable tools, machine tools, instruments for inspection and stockroom equipment. The 103 concerns exhibiting comprised the most representative companies engaged in creating automotive service equipment. Every tool, whether power driven or manually operated, was shown in actual use and visitors were afforded an exceptional opportunity to study advanced facilities for increasing the efficiency of service work.

There are now 141 railway companies operating motor buses as auxiliaries or feeders to existing lines. The question of maintenance is one of decided interest to the superintendents of equipment, master mechanics and shop foremen. The association will extend to the manufacturers of automotive maintenance equipment an invitation to join the association and have an exhibit of their products at the October convention, and it is felt many will avail themselves of the opportunity to participate.

This should prove of decided interest to the executives of these 141 companies operating buses and it is confidently hoped that they will recognize the value of such an exhibit and authorize their subordinates to attend the convention this year.

## Joint Committee on Engineering-Accounting

A MEETING of the joint committee on engineering-accounting was held at the headquarters of the association on May 27. The following committee members were in attendance: P. R. Jacques, Leon R. Brown, chairman of the engineering committee, and George F. Dinneen, chairman of the accounting committee.

The advisability of modifying the classification submitted by the committee to the association at the 1923 convention was discussed, and it was decided to prepare three classifications for roads, depending upon the amount of annual gross receipts, using the classification submitted with last year's report as a basis to work upon. The chairmen will prepare the classifications and are to submit them to the members of the committee for consideration.

## Convention Plans Shaping Up

RAPID progress is being made by the convention committee of the American Electric Railway Association. Subjects to be discussed have been agreed upon, speakers are being obtained, and transportation and exhibit arrangements perfected.

Outstanding subjects to be discussed are: Financing of electric railways, including a discussion of customer ownership; co-ordination of motor vehicle and electric railway service; necessity of electric railway service to communities, to be discussed by the mayor of a large city, a real estate man of national prominence, a United States Chamber of Commerce representative, a public utility commissioner, and a national manufacturer; management and modernization, and traffic problems.

The "Management and Modernization" discussion will be led by regional vice-chairmen of the city and interurban operating committees. These fourteen men, during the last year, have been conducting a survey of electric railway properties throughout the United States in an effort to unearth the most progressive practices.

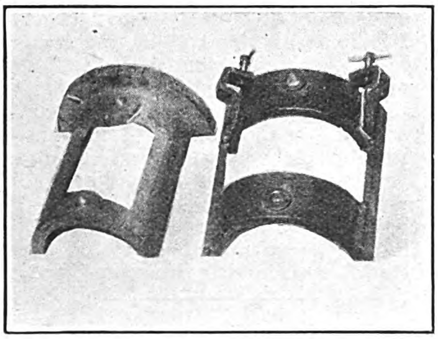
An innovation of setting aside one day wholly for the inspection of exhibits has been suggested by the committee on meetings and subjects. If this suggestion is carried out, no meetings of any associations would be held on Wednesday and a Friday morning session of the American Association would be held.

Encouraged by the success of the inspection and exhibits by a special committee headed by the president last year, the meetings and subjects committee has suggested that the plan be carried out again.

# Maintenance of Equipment

## Jig for Drilling Axle Bearings

THE axle bearings used by the Eighth Avenue Railroad, New York, N. Y., require drilling for dowel pin holes. A convenient jig has been designed in the shop for accurately locating the holes and saving time in the drilling operation.



The Axle Bearing at the Left Has Just Been Drilled for Dowel Pins in the Jig at the Right

An accompanying illustration shows the jig at the right hand side of an axle bearing, which has just been drilled.

The jig has two extension arms at the end which fit over the flange of the axle bearing. These arms are provided with thumb screws, so that with the axle bearing in place in the jig, these are tightened down to hold the bearing firmly in position. This method of clamping insures that the dowel pin holes are accurately located from the flange of the bearing. The holes in the jig are bushed with case-hardened bushings.

## Armature Bearing Shells Turned on Special Centers

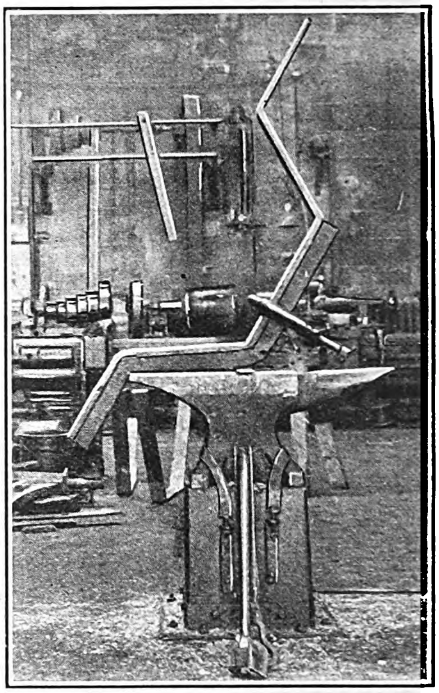
TURNING the outside of armature bearing shells in a lathe is facilitated in the shops of the Pittsburgh Railways by the use of special lathe centers. These eliminate the practice of putting the bearing on a long mandrel and driving it through a dog. The drive to the bearing in this "set-up" is through the live center. This permits the cutting tool to travel the full length of the shell without reversing the work.

Both centers are tapered to a 60-deg. angle and are larger at the base than the bore of the armature shell. The live center is three-sided, while the dead center is conical. This type of center aligns the shell with the inside bore. The three corners of the live center are forced into the rim of the shell by pressure applied by the tail stock through the dead center.

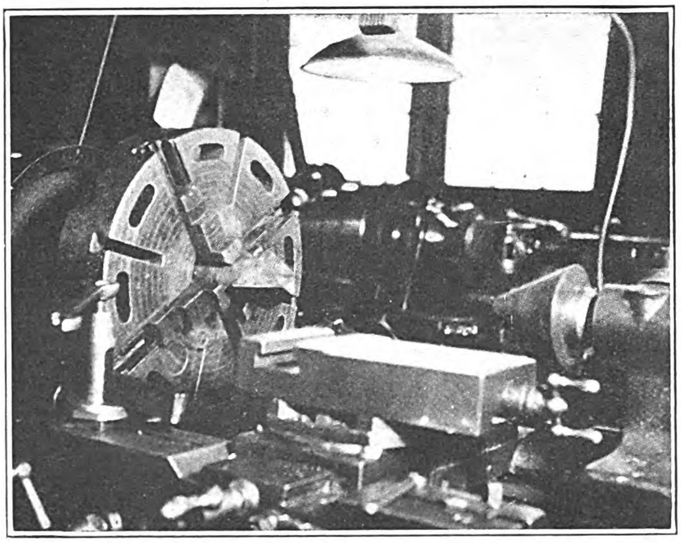
Inasmuch as the usual type of friction bearing between the dead center and the shell would cause slipping of the driving teeth of the live center, a thrust bearing has been incorporated in the design of the dead center.

## Convenient Form for Bending Arch Bars

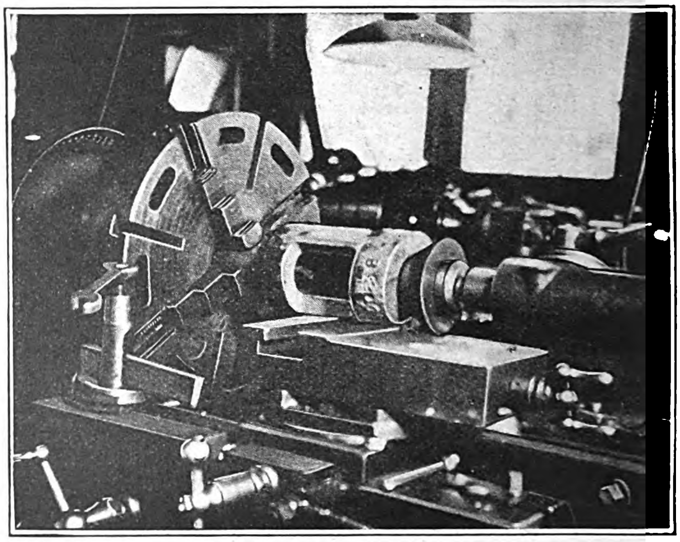
IN REPLACING the arch bars on trucks where these have become broken, the Philadelphia & Western Railway, Norristown, Pa., uses a convenient form for bending the new bars to shape This form is made of square steel stock of the same size as



Completed Arch Bar in Position After Bending



Live and Dead Centers Are Tapered to 60 Deg., the Live Center Being Three-Cornered and the Dead Center Conical and Containing a Thrust Bearing

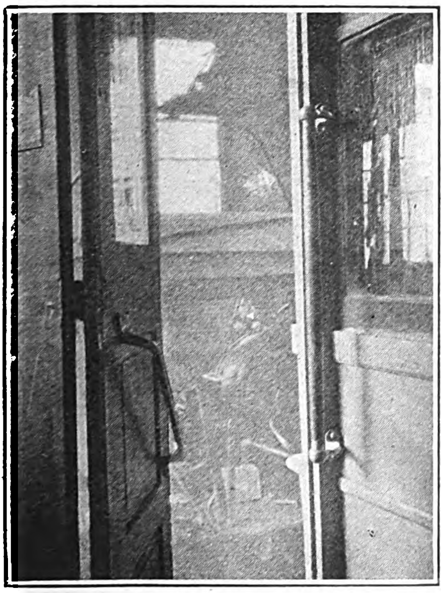


Tapered Centers Hold Armature Bearing Shell, the Live Center Driving the Shell Through Contact of Triangular Live Center the longer dimension of the arch bar. A piece of mild steel of the required dimensions is heated in a forge at the point where the bend is to take place. This is then clamped to the form by a C-clamp, and the bar is then hammered to the required shape to fit in the form. In order to insure that the arch bar fits squarely on the form so as to have the bend at right angles to the edges a small piece extends along the edge, and the piece of steel bar fits up against this while it is held for bending. By use of this form the time for shaping the arch bar has been reduced enormously.

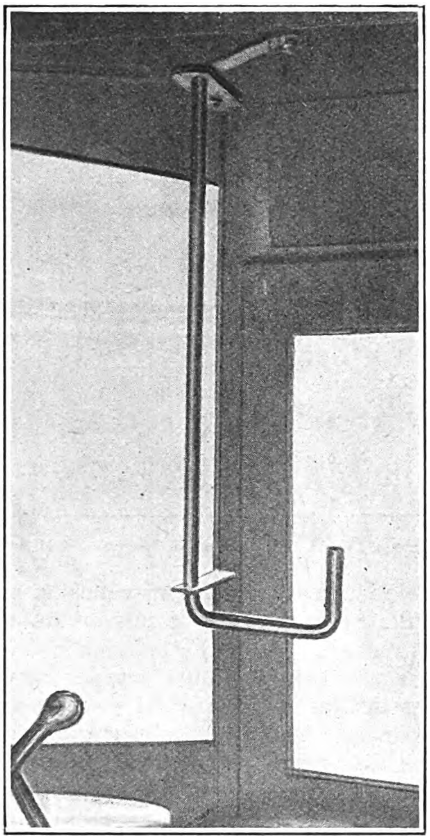
## Improved Door Arrangements in Remodeled Cars

THE New York & Queens County Railway, Long Island City, N. Y., is remodeling ten of its closed cars for one-man operation. These cars originally had inclosed platforms and folding doors and the remodeling changes consist principally of changes in the platform to facilitate one-man operation.

Two sliding doors located at the bulkhead have been removed so as to facilitate passenger movement and the folding doors at the front left-hand side and rear right-hand side have been permanently screwed shut. A platform seat for two passengers has also been installed across these doors. A new stanchion has been installed just to the right of the operator's position for holding the fare box. This is a short stanchion extending about 3 ft. above the floor and it is braced to the hand brake staff support. The register rod has been extended out on the platform and a pull strap added, so that fares may be rung up conveniently by the operator.



Arrangement of Grab Handles on Inside of Platform and on Folding Door



Operating Mechanism for Hand Control of Folding Doors

The platform doors originally were arranged to fold against the bulkhead. These have been changed with hinges added on the opposite side, so that as remodeled they fold against the dash. This arrangement provides less interference with passenger movement and also makes a more convenient installation for hand operation of the doors.

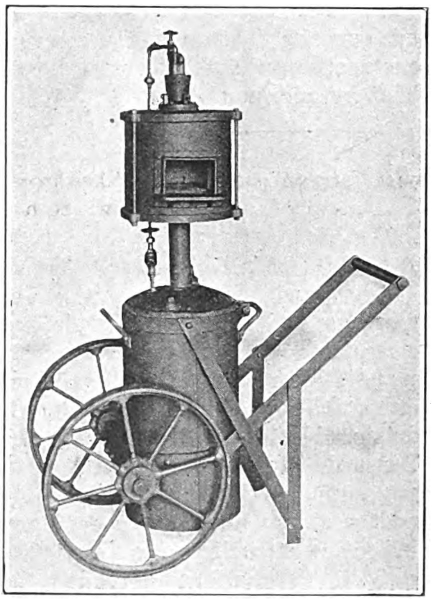
An accompanying illustration shows the mechanism added for the door operation. A 1-in. iron rod bent so as to provide a handle and lever for operation extends from a point just above the hand brake staff to the vestibule headlining. This is supported by brackets to the vestibule window post. The upper end of this rod has a bell crank lever and connection to the doors. To open the doors the operator pulls the handle toward him. In order to lock this mechanism at the rear end of the car a pin is provided with a chain fastening which fits into a recess in the top support just ahead of the bell crank lever. With the pin inserted, the door-operating mechanism cannot be moved.

These cars originally had grab handles on the outside of the doors. These have been removed and one of them installed at the bulkhead side of the door opening, inside the platform vestibule. An additional grab handle has been added to the inside of the door nearest the bulkhead. When the door is in the open position the handle is in convenient position for passengers who are boarding or alighting, and when the door is closed this handle is on the inside of the car, so that no support is provided by which passengers might hang onto the outside of the car.

## New Equipment Available

### Improved Oil Burning Rivet Forge

IMPORTANT changes made in the construction of the oil-burning rivet forges manufactured by the Buffalo Forge Company, Buffalo, N. Y., include an extension of the fireproof liner through the fire opening in the steel shell and a redesigned bottom plate made with a liberal shelf extension to receive hot rivets.



Portable Oil-Burning Rivet Forge

In the old rivet forge a cast-iron frame, attached to the shell with six rivets, constituted the fire opening. The brick hearth itself extended only to the inside edge of this opening. The shelf for the rivets was cast as part of the frame piece and extended direct from the opening and on a level with the fire. This design, however, was at times unsatisfactory. The heat generated invariably resulted in a loosening of the rivets holding the frame, and this in turn was followed by a burning of the edges of the shell itself. In addition burning of the rivet shelf resulted. With the new design the fire-clay liner extending over and around the edges prevents a direct contact of the fire with the sheet steel casing, and the placing of the shelf on a lower level, in one piece with the bottom plate of the fire chamber, prevents all possibility of a burnt-out shelf.

The forge consists essentially of a welded steel oil tank on which is mounted a head, or fire chamber. This head is made up of a circular steel plate housing held between the cast-iron top and bottom plates by means of three bolts. The lining of the fire chamber is a one-piece, circular section of firebrick 2 in. thick at the sides and 2½ in. thick at the bottom.

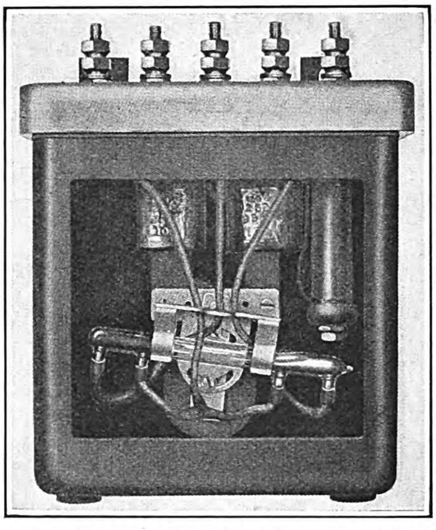
The oil tank is tested under a pressure of 125 lb. to insure against leakage. Air is supplied by a single connection which furnishes pressure for the oil supply, as well as for the atomizer. Kerosene, distillate or any fuel oil is burned in this forge.

The unit illustrated is portable and especially adapted for use on construction work. It can be moved about by one man.

## Automatic Signal Flasher Relay

An automatic electric flasher designed for railway grade crossings and highway signals has been placed on the market recently by the Bossard Railway Signal Corporation, Troy, N. Y. The device is registered under the trademark "Bossard Flashmore." This company supplies the flasher relay only and the signal itself may be of any kind of construction requiring two lights to flash alternately upon the approach of a car or train.

The distinguishing feature of this relay is the absence of metal contacts. As the current is broken through a mercury contact within a sealed glass tube, in which the air has been replaced by inert gases, there is no possibility of oxidation of mercury. The relay has an armature oscillating between the poles of an electromagnet. To this armature shaft is fastened a pendulum which is oscillated by the electric current in one direction. With the opening of the circuit, the pendulum returns automatically to its original position by gravity. The glass tube is mounted on this pendulum and has four contact pockets, into which leads are sealed for carrying the current.



New Flasher Relay with Mercury Contact

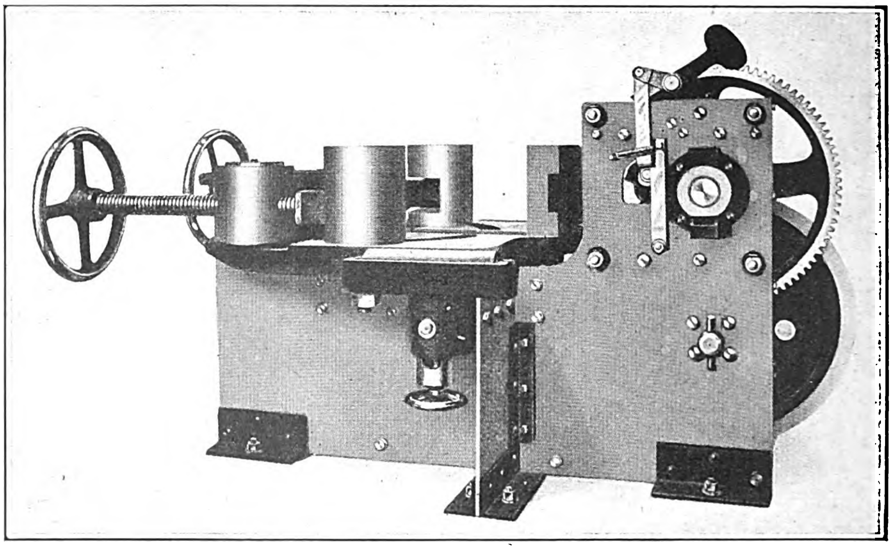
The magnetic field is independent from the load current and therefore constant under all conditions of the load circuit, regardless of how few or how many lamps are being used. The burning out of lamps or the adding of more lamps, therefore, does not affect the brilliancy of the light or the speed of the flasher.

The weight of the pendulum holds the contact tube in such a position that both contact pockets, which control the air circuit through one set of lamps and through the magnet coils, are closed. This provides a safeguard in case of failure of the operating mechanism as it displays a set of lights as a warning. Where the flasher is used in connection with electric railway installations which use direct current for propulsion, it can be set in operation by means of interlocking relays operated by alternating-current track circuits, superimposed upon the direct-current propulsion circuit.

## New Bending and Straightening Machine

A new horizontal eccentric bending and straightening machine, particularly adapted for bending rails, bars, angles, beams, etc., is being offered to the trade by Henry Pels & Company, Inc., New York, N. Y. This machine has a very heavy steel plate frame, steel gears, and forged shafts and pinions.

The table is especially wide and has a horizontal roll on each side which facilitates handling of material. The bending blocks are adjusted independently of each other by hand wheels and screws that move them in the arc grooves. The bending blocks move forward or backward on an arc, the center distance thus being shortened when near the ramhead and lengthened as they recede. This movement automatically accommodates the varying sizes of sections and lengths of radius. The arc line of travel of the bending blocks has been determined from the moment of resistance of various sections figured theoretically and combined with results of actual tests. When bending track rails or similar heavy sections it is advisable to use filler blocks between the ramhead and the section with the bending blocks well separated. Any length of rail can be run through the machine as is found necessary.



Horizontal Eccentric Bending and Straightening Machine

# The News of the Industry

## Mayor Ready to Act

### Chicago Executive Said to Be Prepared to Pay $162,000,000 for Surface Lines

Events indicate that Mayor Dever of Chicago is ready to recommend to the City Council that the city buy the Chicago Surface Lines at the price set in the 1907 traction ordinance—$162,000,000 as the capital account now stands—now that conferences with the Surface Lines officials have been suspended, while similar negotiations with the officials of the Chicago Rapid Transit Lines are ready to proceed.

At the eleventh conference between city officials and bankers and Surface Lines officers it was virtually agreed that the bankers and the security holders would stick to their contention that the full price should be paid.

The bankers, particularly, are reported to have informed the Mayor that a dangerous precedent would be established if the security holders were requested to repudiate a part of their holdings. Inasmuch as a market for the Schwartz municipalization certificates must be created, the city officials would be virtually unable to proceed with the municipalization project without the bankers' co-operation. That co-operation, it is reported, would not have been forthcoming unless every security was taken up dollar for dollar.

Included in the $162,000,000 purchase price is $6,000,000 in new rolling stock and extensions which has not increased the price to the city. In addition, the lines will turn over to the city their renewal fund of $14,000,000 and the personal-injury fund of $5,000,000, thus bringing the actual price down to $141,000,000.

Upon the completion of the negotiations, Mayor Dever, in a special message to the City Council will set forth his reasons for believing that the municipalization of the traction properties is desirable. The Mayor was one of the leaders in the municipal ownership fights twenty years ago in the Council, and he is hopeful that the Council as now organized will give him friendly support in what he regards as the most important problem before the administration.

## Queens Abandonment Hearing Adjourned

Before Supreme Court Justice Joseph Aspinall, in Long Island City, on June 4, the political aspect of the transit situation in New York city was brought out with prominence when the argument was heard on the motion of Gen. Lincoln C. Andrews, receiver of the New York & Queens County Railway, for an order permitting him to abandon service on the lines and to surrender the company's franchises.

Col. William N. Dyckman, associate counsel with H. P. Williams, representing the receiver, objected to an adjournment for a week that had been asked for by Assistant Corporation Counsel Vincent Victory unless the court would grant the adjournment on conditions.

One of these conditions, as stated by Colonel Dyckman, was that the members of the Board of Estimate of the city of New York would go with representatives of the railway to the Transit Commission and join in a request for an increased fare. Mr. Dyckman said:

> We know the feelings of the members of the Board of Estimate, and the head of this city, and the board's willingness to destroy railway property in this city. We want a condition made in the order of this court granting the adjournment that the Board of Estimate must go to the Transit Commission and ask them for an increased fare. We believe that with such an order in his hand to back him up, Borough President Connolly can make some headway with the Board of Estimate.

Justice Aspinall granted the request of the city authorities for a week's adjournment, but refused to impose the conditions requested by representatives of the railway. So it would appear that maintenance or abandonment of lines serving 40,000 a day after that date depends upon Mayor Hylan.

Borough President Connolly has announced that he will bring the matter before the Board of Estimate on June 9 when it meets as a committee of the whole.

## Railway Rejects Cleveland Wage Award

### Men Granted Twelve-Cent Advance, but Company Asserts Finding Is Not Fair Because of Proved Prejudice of Fifth Member of the Board of Arbitration—Situation Appears Tense

PLATFORM employees of the Cleveland Railway, Cleveland, Ohio, numbering some 3,000 motormen and conductors, were on June 3 awarded a wage increase of 12 cents an hour by a board of arbitration, from which the company withdrew its representatives after the first session following the submission of evidence and arguments The men had sought a 15-cent increase. The wage increase means that dating back from May 1 the men are to receive 67 cents an hour for the first three months of service, 69 cents an hour for the next nine months and 72 cents an hour after the first year, instead of 55, 57 and 60.

Representatives of the Cleveland Railway assert that the award of the board of arbitration will not be carried out. William Polk, president of the local street car men's union, says that a strike will be called if necessary to enforce the award.

After four days of public hearings the work of taking evidence from both the men and the company was ended on May 26. Arguments were heard on May 27 by attorneys representing both sides. After a private meeting by the arbitrators on May 28 Attorney Carl Higley and Thomas P. Schmidt, representing the company, declared their intention to withdraw from the board on the ground that the fifth man on the board, James W. Holcomb, formerly city street railway commissioner, instead of being neutral, was actually prejudiced in favor of the men.

John J. Stanley, president of the railway, notified Mr. Holcomb that the company considered that he had disqualified himself and that the company would not participate in the deliberations of the arbitration board. Directors of the Cleveland Railway met and approved of Mr. Stanley's stand, pointing out that the company would repudiate any decision arrived at by Mr. Holcomb and the two representatives of the union on the board.

The company based its repudiation of the arbitration board and its award upon Mr. Holcomb's attitude during the taking of evidence, his comments during the hearings and the fact that four days after he had been agreed upon as the fifth man in the arbitration proceedings a letter had been sent by John G. Owens, secretary of the Cleveland Federation of Labor, to the Senators from Ohio at Washington indorsing Mr. Holcomb for the position of United States Collector of Customs at Cleveland. In this letter Mr. Owens stated that Mr. Holcomb was qualified for the post, that the labor federation of Cleveland indorsed him and that he had been named as the arbitrator in the wage dispute between the railway and its employees.

In announcing the wage increase of 12 cents an hour, the three members of the board of arbitration participating in the award also allowed the company platform employees fifteen minutes' time for making out accident reports, but rejected all other demands of the union for changes in working conditions. Union officials say the award is satisfactory.

In a statement appended to the award, Mr. Holcomb and his two colleagues representing the union, United States District Attorney A. E. Bernsteen and Max Hayes, editor of a Cleveland labor publication, said that they would back the car men in getting the award and that the decision was reached without bias or prejudice.

The statement also asserted that the award would cost the company approximately $966,400 additional each year and that the fifteen minutes' pay allowed for making out accident reports would cost an additional $12,000. The statement claimed that the company could offset the increased charges against it by reason of the higher pay if it managed to reduced the amount of damage claims paid annually and if it consented to a reduction in its allowance for maintenance, depreciation and renewal.

Accident and damage claims paid by the company last year were $1,582,595, or nearly 10 per cent of the gross earnings, while according to the majority of the board of arbitrators the cost of damage claims in Detroit is only 1.26 per cent of the gross earnings; Boston, 1.75 per cent; Cincinnati, 1.85 per cent, and Chicago, 2.5 per cent.

The statement of the majority of the board also pointed out that by reason of an increase in the company's maintenance fund from 10 to 12 cents a car-mile in the latter part of 1921, the company in 1922 not only wiped out a deficit of $240,000 but piled up $1,182,252 as a reserve fund in this account and stocked up with materials and supplies to the amount of $1,158,235.

According to the majority report, the company could pay the increased wage allowed if it made the saving the board felt it could in its claims for damages and in its maintenance fund and still have a balance left of more than $742,363.

If the company insists upon not signing a new contract with the union containing the increased wage award, union officials say that a strike vote will be taken, but that they will attempt to prevent a cessation of service in Cleveland until after the Republican national convention, which is set to start June 10.

## Decree Signed in New Jersey Fare Case

Federal Judge Rellstab of the United States District Court at Trenton, N. J., on May 28 signed a final decree permanently enjoining the Board of Public Utility Commissioners of New Jersey from enforcing its order of July, 1921, fixing fares at 7 cents, with 2 cents for a transfer, on lines of the Public Service Railway. Accordingly, the present fare schedules, including the zoning system, will continue in effect.

The decree also contains a clause setting forth that counsel shall be heard in the United States District Court at Trenton June 9 on the question of costs of operating the lines. Included in the costs is $25,000 which the railway by direction of Judge Rellstab, has paid to former Federal Judge Thomas G. Haight of Jersey City, as special master.

Reference to the ruling of the court in this connection was made in the ELECTRIC RAILWAY JOURNAL for May 31, page 869.

## Five-Cent Fare With Tickets in Tacoma

The Tacoma Railway & Power Company, Tacoma, Wash., has arranged with city officials for a 5-cent ticket fare, with the $1 weekly pass to be continued in effect. The new fare does not include transfer privileges. It became effective on June 1. On its part the city has agreed not to issue any more permits for buses other than those which the Mayor might see fit to allow the company to operate during the experimental period of six months while the new fare is being tried out.

At an early conference, other details of the proposed agreement, including the question of paving between tracks, will be threshed out. City officials will co-operate with the company in an effort to cut down its expenses in paving.

Railway officials say that only the operation of the new system over an experimental period will settle the question of whether or not the system of selling tokens at the rate of twenty for $1 will have a satisfactory appeal in view [illegible] the proposed continuance of the weekly pass at $1.

## Cincinnati Contract Renewed for Two Years

Members of the carmen's union, Local No. 11, recently voted to renew their present contract with the Cincinnati Traction Company, Cincinnati, for a term of two years. The vote was 826 for the renewal and 265 against. The present agreement is based on a maximum wage of 53 cents an hour, with 7 cents an hour additional for operators of one-man cars. The clause concerning schedules of "owl" cars refers to the time that their operators start to work. Formerly the men on the "owls" reported for work at 7:45 p.m. and went off duty at 5:45 a.m. Under the present schedule they start to work at 11 p.m. and quit at 8:15 a.m. The men believe that the former schedule is preferable. A clause regarding regular crews on regular cars refers to the fact that the men wish to be supplied with a regular car and be permitted to use it daily as long as it is in running order.

Several weeks ago the men turned down a proposition submitted by the union's board of directors in which it was proposed to renew the present agreement for one year.

## Group Insurance Policies for Roanoke Employees

A group life insurance policy under the terms of which the 315 employees of the Roanoke Railway & Electric Company, Roanoke, Va., receive protection of $1,000 each has been placed with the Metropolitan Life Insurance Company. A total of approximately $350,000 in insurance is involved in the policy. The premiums will be paid on a contributory basis, with the employers and workers sharing in this cost. In the event of illness, an insured employee of the company may summon a Metropolitan nurse who will assist in the care of the patient and see that the instructions of the attending physician are followed. In addition to this service, the Metropolitan will distribute to these new policyholders at frequent intervals the instructive pamphlets published by that company. These, compiled by experts, deal with timely health and sanitation subjects.

## Want Five-Cent Fare in East Boston

Like several of the other zones in Boston which have obtained a 5-cent local fare from the Elevated, the East Boston district desires to be classed as a zone on the system, so that the 5-cent fare may be granted. It wants a 5-cent fare through the tunnel at least as far as Devonshire Street. James F. Jackson, chairman of the board of trustees, has explained that the question whether to grant a 5-cent fare within the limits of East Boston from one section to another may not take very long to decide, but the idea of granting it on the rapid transit system is entirely new to the service. The 5-cent fare thus far applies entirely to the surface cars. The trustees say that under the law they cannot make the general reduction now suggested until the company has liquidated the advance made by the communities which helped the company take care of its deficit during the year 1919.

## Seattle Tax Case Reviewed

Three judges in the United States District Court at Seattle took under advisement on June 2 applications of the Old Colony Trust Company and the Puget Sound Power & Light Company for temporary injunctions restraining the Sheriff of King County from selling the power company's holdings to satisfy street railway taxes assessed for 1919. The details of the purchase by the city of Seattle from the power company of the street-railway lines were reviewed, as well as the court proceedings subsequent thereto and recent action taken to obtain payment of taxes. The Old Colony Trust Company received permission to file a supplemental bill, and motions of the defendants for dismissal were taken under advisement.

James B. Howe, representing the power company, argued that the county authorities had no right to levy upon the power company's present property, on which all taxes have been paid for 1919, for taxes on the street-railway property, on which property the state Supreme Court and the United States Supreme Court have held the taxes to be a specific lien. By the terms of the contract and deed conveying the car lines to city, Mr. Howe asserted, the company and the city agreed that each should pay taxes for that portion of the year 1919 during which title to property was held by it, the city being thus obligated to pay three-fourths of the taxes, with interest and costs, and the power company one-fourth. The Corporation Counsel of Seattle asserted that the city was not properly a defendant in the action and moved for dismissal. The intimation that the city and the county were in collusion to force company to pay the entire taxes for the year 1919 was vigorously denied.

On June 5 the three United States District Court Judges who heard the arguments dismissed the corporation's application for an injunction. The court held that it had no jurisdiction in the case of the trust company and that in the case of the utility the company had an adequate remedy in law.

### Hearing for Increased Fare Petition

The Maine Public Utilities Commission has issued notice for a hearing on a petition filed by the Androscoggin Electric Company, which operates the Lewiston and Portland interurban system, asking for increased fares. Under the proposed schedule the fare between Lewiston and Portland would be raised from 93 cents to $1.00, with corresponding adjustments on intermediate fares; the charge for special car service would be increased from 75 cents to 85 cents per mile, with a minimum charge for such service raised from $10 to $15. These new rates have been suspended until Aug. 15 pending hearing and investigation.

### Effort to Stop Fare Increase in Baltimore Fails

An effort to prevent the United Railways & Electric Company, Baltimore, from putting into effect the 8-cent cash fare for single fares or two tickets for 15 cents, recently granted by the commission, failed in court on May 31 and the fare order became effective on June 1. The attempt to have the court halt the increase was made by Mayor Howard W. Jackson, who sought both a temporary and permanent injunction as a taxpayer and also in the name of the Mayor and City Council.

City Solicitor Philip B. Perlman contended that the Public Service Commission had no right to fix fare rates without a valuation of the company's property except in an emergency. This valuation has been ordered by the commission and will require several months.

Judge Charles F. Stein in Circuit Court ruled that to grant the injunction he must find the order void because it is unreasonable or unlawful. He said that he must assume that the Public Service Commission acted upon the evidence presented. The court made it plain that in acting upon the application for a temporary injunction it was not expressing any opinion on the evidence.

A hearing date will be set in the near future on the appeal for a permanent injunction.

### Bus Project in Syracuse Still Pending

Syracuse, N. Y., is apparently no nearer having bus lines in operation than it was months ago. Several firms have applied for franchises or licenses to operate lines on James Street, one of the best residential sections of the city, but the Common Council has opposed granting the permits.

The Syracuse Railroad Co-ordinated Bus Lines, Inc., a subsidiary of the New York State Railways, has been formed to operate bus lines. No decision has been reached as to what fare is to be charged or what form the bus lines will operate under, franchise or license. The city insisted a short time ago on a 5-cent fare and transfers, but this stand has been modified. The railway is understood to feel that a 10-cent bus fare would be necessary under its proposal if the bus lines are to be made self-supporting from their start, while the other interests that have signified their desire to be permitted to operate bus lines have indicated that they believe an 8-cent fare would prove sufficient to return a profit under the proposal advanced by them.

### Ten New Buses Being Run by Indiana Interurban

The Indiana, Columbus & Eastern Traction Company, which operates bus lines paralleling its railway from Dayton to Columbus, Ohio, and from Springfield to Lakeview, Ohio, has increased its bus service by placing ten new Fageol buses of the latest design in service on its two bus divisions. Each of the new cars accommodates twenty-two passengers. The new buses replace 7-passenger Studebaker cars.

Despite the fact that they are slower than the electric cars with which they compete, many persons seem to prefer the buses in summer, according to F. A. Healy, treasurer of the company, and since the company sells transportation it was decided to give the riding public what they want. There are several competing bus lines which cover the same territory.

### Reports Favorably on Investigation Into Boston "L" Additions

The joint rules committee of the Massachusetts Legislature has reported favorably a joint resolve providing for an investigation into methods for financing additions, extensions and improvements of the Boston Elevated Railway systems and of the advisability of terminating or continuing public operation. The resolve was recommended by the Metropolitan Planning division when it appeared that the system was unable to finance needed improvements and was favored at the hearing before the committee by H. Ware Barnum, general counsel for the trustees of the road. Mr. Barnum said the road would need $1,500,000 for additional equipment in the extension of the Shawmut branch in Dorchester. He also informed the committee that the extension of the Boylston Street subway was under consideration and the extension of the rapid transit service from Lechmere Square to North Cambridge. He said that 125 additional steel cars were needed for replacements and 400 modern semi-convertible cars, at a total cost of $10,000,000.

## Relief from Congestion Suggested in Chicago

### Conference of Transportation Interests There to Agree on the Terms of Traffic Order from State Commerce Commission to Go Into Effect in Loop District on July 1

Plans for reducing loop traffic congestion in Chicago through a rerouting of both surface line cars and west side buses have been tentatively agreed upon by city officials and representatives of both the Surface Lines and the Chicago Motor Coach Company, in a hearing called before the Illinois Commerce Commission.

In opening the hearing, Col. Frank A. Smith, chairman of the commission, said the commission felt it to be its duty to co-operate with the city to the end that transportation facilities, especially in the loop district, might be speeded up and made safer for the public.

Maj. R. F. Kelker then explained to the commission members the plan which has already been tentatively agreed upon by representatives of the Surface Lines and the city, by which it is hoped that service on the lines can be increased by about 30 per cent and at the same time create a clearer passage for other vehicles.

Installation of the plan, described in detail in this paper, issue of May 3, page 683, will entail the expenditure of approximately $100,000 on the part of the Surface Lines. Among its features are:

1. Twenty left-hand turns in the loop district bounded by Wabash Avenue, Wells Street, Lake Street and Harrison Street, will be eliminated, leaving only five left-hand turns within the same district.
2. At the same time the right-hand turns will be cut from thirty-eight to twenty-six within this district, and two of the present sub-terminals in the loop will be eliminated, leaving only one.
3. Changes will be made in the routes of thirty-two car-lines.
4. Washington Street buses will turn on Clark Street instead of on State Street, according to the agreement.
5. State Street is to be left clear for through traffic, and except in emergencies, the third track on State Street is not to be used.
6. West side street cars will use Dearborn Street as a turning point instead of State Street.

"In a normal twenty-four hour period," Maj. Kelker told the commission, "street cars in the loop proper at present make just 6,092 left turns. Under the proposed plan, these left-hand turns in that period would be reduced to 1,920. Similarly, the right-hand turns will be reduced from 16,486 to 14,225.

"An actual check of the flow of pedestrians and vehicles at the corner of State and Madison Streets in one hour of the afternoon showed 46,600 pedestrians and 2,000 vehicles entered that intersection. It is the right- and left-hand turns of street cars and buses in State Street that blocks this traffic constantly, and under the proposed plan many of these turns are to be eliminated in the loop area."

The benefits of the new plan will come about through the construction of eight new curves and the removal of four or five elevated structure columns from the middle of the street to behind the sidewalke line, Maj. Kelker explained to the commission.

Attorneys for the three interested parties were instructed by Chairman Smith to agree on the terms of an order which will be submitted to the commission within a few days. After that, the new traffic plan will be submitted to the Council for changes in the city ordinances, permitting the plan to go into operation, which it is hoped will be about July 1.

## Hornell Traction Goes Back to Eight-Cent Fare

The Public Service Commission permitted the Hornell Traction Company Hornell, N. Y., on June 2 to return to an 8-cent fare which it had charged in its operating zone up to May 1. The commission, on the request of Receiver Page, permitted the company to reduce its fare to 7 cents, believing that the smaller fare would attract more patronage and increase the revenues of the company. This move, the receiver learned, was not a successful one, and he asked that the road be again permitted to charge the 8 cents if operations were to continue. The receiver says that under the 8-cent fare the average daily earnings of the company from Jan. 1 to May 1 were $150.70, while from May 1 to May 13 the average daily earnings under the 7-cent fare were $115.25. Since May 13, the receiver says, the revenues of the company has continued to go down until they run from $90 to 100 per day.

## Ottawa Wage Agreement Continued

An agreement was entered into on May 19 between the Ottawa Electric Railway, Ottawa, Canada, and its Amalgamated employees whereby the contract signed in 1922 will continue in effect until May 1, 1926, with the following principal changes.

All permanent employees who are paid by the hour except shop hands and apprentices will receive 1 cent an hour increase for the period from May 1, 1924, to April 30, 1925, and 2 cents an hour increase for the period from May 1, 1925, to April 30, 1926, over the wage rates in effect on April 30, 1923.

The wage rates for conductors and motormen beginning May 1 are 44 cents for the first year, 46 cents for the second year, 47 cents for the third year and 49 cents for the fourth year and thereafter. On May 1, 1925, these rates will be increased to 45 cents, 47 cents, 48 cents and 50 cents respectively.

The other clauses of the agreement signed in 1922 continued in effect until May 1, 1926. The important items which are not changed are time and one-half for overtime on week days for a standard day of nine hours, time and one-quarter for work on Sundays and legal holidays and one-half cost of uniforms for first year and free thereafter.

## Wage Contract in Toledo Remains

After three weeks of negotiations a new contract has been worked out between the Community Traction Company, and officials of the car men's union at Toledo which is substantially the same as the one which expired on May 21, 1924.

Wages remain the same. They were 50 cents an hour for the first three months, 52 cents for the succeeding nine months and 55 cents an hour thereafter. One-man car operators are granted 5 cents an hour extra. Only minor changes were made in some of the working conditions.

The men had asked for a 20 per cent wage increase and changes in working conditions, including two weeks' vacation with pay and closed shop on the entire property. At one stage the company had proposed a compromise vacation of one week with pay to men with the company more than five years, but that was voted down by the men.

## Parking Rules Suggested

### New York State Conference of Mayors Would Fix Drastic Limits on Trolley Traveled Streets

A committee appointed by the New York State Conference of Mayors has just reported to that body on the parking evil. The committee is headed by Mayor John A. Giles of Binghamton. It believes that in congested districts no parking should be allowed in a street in which surface cars operate unless there is room for at least one line of travel 10 ft. in width between the street car area and a line of vehicles parked at the curb. In streets in which trolley cars do not operate parking should be prohibited unless there is room for one line of travel in each direction or 20 ft. in width to accommodate both lines of travel, between cars parked at either curb or between the curb and one line of vehicles at the opposite curb. This is the very minimum under which parking should be allowed. The committee says this will not, however, solve the parking problem, for traffic will be impeded and often interrupted and the fire hazard will be great.

The committee says that under such conditions, and with parallel parking, the minimum width of roadway should be as follows:

Streets with a single trolley line, 47 ft. roadway.
Streets with a double trolley line, 57 ft. roadway.
Streets with no trolley line, 38 ft. roadway.

It is the belief of the committee that traffic will not be seriously affected and fire hazards will be practically eliminated if parking is allowed only in a congested street the roadway of which will accommodate two lines of moving traffic and one line of parked cars between the street car area and the curb or two lines of traffic in either direction between cars parked at either curb in streets where trolley cars do not operate. Under such conditions and with parallel parking, the committee feels that the minimum width of roadway should be as follows:

Streets with a single trolley line, 67-ft. roadway.
Streets with a double trolley line, 77-ft. roadway.
Streets with no trolley line, 58-ft. roadway.

The committee says that whether parking should be prohibited absolutely or in part in streets whose widths are greater than those previously specified depends upon traffic conditions. It says that no general recommendation can be made for such streets.

The committee says that time limits on parking should be established on all streets where parking is permitted to prevent all-day and all-night storage of vehicles. The length of the parking period should be determined by the demand and need for parking capacity.

The committee says:

> We believe that cities either should provide parking space in or near the congested district or should encourage private capital to do so, either before parking is prohibited or greatly curtailed or as soon afterward as possible. When minor or side streets, vacant lots, parks and squares and interiors of blocks will no longer meet the needs there should be provided garages, either privately or publicly owned, and operated for half-day and day storage. Our data show that as long as parking is allowed private capital hesitates to invest in large downtown garages. Cities should also encourage the construction of garages in sub-center districts.

## Additional Bus Permits Sought by New Jersey Railway

The Board of Public Utility Commissioners of New Jersey has set June 9 as the date for a hearing on the request of the Public Service Railway to take its cars off what is known as the Fifth-Broadway line in Camden, a crosstown service. Two buses of the Public Service Transportation Company, a subsidiary of the railway, are now rendering service in the area.

Effective on June 8, the railway has notified the commission that it will reduce from 7 to 5 cents its single fares on eight bus lines in the city of Camden and environs.

The railway will abandon service on the Kenilworth line, operating between Westfield Avenue and Kenilworth. The Public Service sets forth that for the year 1922 the gross receipts from the line were $10,571 and that the cost of operation, including taxes, but excluding fixed charges or any return on capital invested, was $25,139. In the last three months of 1923 the gross receipts were $874 and costs $6,000.

## Fort Wayne People Save Weekly Passes and Get Prizes

As the hundredth week of the successful régime of the weekly pass in Fort Wayne, Ind., approached, it was rumored that the Indiana Service Corporation intended to give a prize to everyone holding the complete set of ninety-nine passes. The railway, of course, had nothing of this kind in mind, but the rumors became so prevalent that the company sensing the value of such publicity, made a formal announcement that prizes would be given. It was thought improbable that many people had saved the entire ninety-nine passes and therefore the company made the offer a little more lenient by extending the prizes to those who had saved fifty consecutive passes.

To the surprise of the officials of the company, fifteen people presented themselves at the cashier's office the morning the prizes were awarded. Eleven had fifty consecutive weekly passes and each received a prize of $1. Four had the entire one hundred passes and each of these four received $2.

The announcement of the intention to award the prizes and the later announcement of the winners were made in a quarter page advertisement in the local newspapers. As indicated before, the company was led into the matter indirectly by the rumbling rumors, but the stunt afforded an opportunity for some splendid publicity, and produced considerable favorable comment and increased the good will among the riders.

## Mr. Storrs Will Attend Advertising Meeting in London

L. S. Storrs, president of the Connecticut Company, New Haven, will go as a delegate from the American Electric Railway Association to the international convention of the Advertising Clubs of the World in London beginning on July 16. At that meeting the Public Utility Advertising Section of the Advertising Clubs of America will participate in the deliberations. Lord Ashfield, chairman and managing director of the so-called underground group of transportation interests, who began his railway career in the United States as Albert H. Stanley, will welcome the American delegation. Mr. Storrs will respond on behalf of the American utility delegation.

## News Notes

**Will Fight for More Subways.**—The Brooklyn Chamber of Commerce is concentrating all its efforts in bringing before Mayor Hylan and Borough President Riegelmann the need for the speedy construction of the Brooklyn crosstown subway and the completion of the Fourteenth Street-Eastern District line. The chamber is now proceeding under a new slogan, called "Throw Dirt, but Not the City Hall Kind." At a recent luncheon at which this principle was advocated more than fifty representative business men pledged support to the movement.

**Wants Increased Fares.**—The Washington, Baltimore & Annapolis Electric Railroad, maintaining service from Washington, Baltimore and Annapolis, has petitioned the Maryland Public Service Commission for permission to increase its fares 20 per cent on single tickets and round trip tickets and 10 per cent on commutation books.

**Railway to Substitute Bus.** — The Aurora, Plainfield & Joliet Railroad has petitioned the Illinois Commerce Commission for permission to discontinue railway service between Joliet and Aurora. It is the purpose of the company to operate buses between the two cities. No opposition is expected on the part of Joliet or Aurora to the company's plan, but it is understood that the two cities will insist that the commission, if it sees fit to grant the permit, shall insist that the tracks be removed and the roadway restored.

**Railway Man Heads Jury in Slayer's Case.**—F. D. Hoffmann, assistant secretary and assistant treasurer of the Chicago Surface Lines, is foreman of the Grand Jury which has before it the case of Leopold and Loeb, confessed slayers of Robert Franks.

**Eight-Cent Fare in Kingston.** — The Public Service Commission issued an order on June 4 permitting the Kingston Consolidated Railroad, Kingston, N. Y., to increase its cash or ticket fare to 8 cents. No change is made in the present regulation as to transfers, school or other reduced rate tickets.

**Fare Testimony Closes.**—At the conclusion of the presentation of the last evidence bearing on the question of fare rates in the state of Connecticut the Public Utilities Commission on May 26 ordered the Connecticut Company, which is petitioning for approval of a rate advance in Bridgeport and corporation counsels of several cities opposing an advance already put into effect outside of Bridgeport, to file briefs by June 16. The briefs were ordered submitted simultaneously. The commission, however, extended until June 23 the time for the filing of rebuttal briefs by both sides.

**Bus Company Authorized to Compete with Railway.** — The Richmond Rapid Transit Company, Richmond, Va., has been authorized to operate over Broad Street for thirty blocks through the heart of the city in competition with the Virginia Railway & Power Company's electric lines and over the protest of the railway. Formerly touring cars of independent operators competed with the railway, but these were legislated off street car routes.

**Negotiating on Wages.**—Negotiations are in progress looking toward a settlement of the wage controversy between the Rochester, Lockport & Buffalo Railroad, Rochester, N. Y., and its employees. The men claim they are being paid 4 cents an hour less than the employees of the Rochester & Syracuse Railroad, which operates between Rochester and Syracuse. John Pallace is representing the employees and is conferring with William W. Foster, general manager. If they fail to agree formal arbitration will take place.

**Mr. Sawyer Entertains Veterans.**—The East St. Louis & Suburban Railway Twenty-five-Year Club held its second annual meeting recently in the offices of W. H. Sawyer, president of the company, who is an honorary member of the club. Tribute in the form of a memorial was paid to the memory of D. S. Van Houten, a charter member of the club, who died in February. Eight new members who had attained the coveted twenty-five years of continuous service were admitted to the club rolls. The business session was followed by an automobile trip through beautiful Forest Park in St. Louis, after which the club members went to the Missouri Athletic Club for dinner. Place cards were in the form of checks for $25 each.

**"Claims Department" Abolished as Title.**—The name "Claim Department" was abolished on June 1 by the Chicago Surface Lines. For it has been substituted the "Department of Accident Investigation." Frank J. Gatrell, who has had the title of "General Claim Agent," is now known as "Superintendent Department of Accident Investigation." The new title is not so suggestive as the old one and really much more fittingly describes the scope of the activity of this particular department of the company.

**Bill Provides for Eight Hours in Eleven.**—The Massachusetts House instead of ordering an investigation into the question of eight hours in eleven for street railway employees recently substituted a bill providing for eight hours in eleven. The vote on the roll call was 137 to 62. The bill was originally filed by Representative George E. Keegan, Lawrence, an official of the union of the Eastern Massachusetts Street Railway. Although the committee on street railways reported against it, the bill was adopted in the Senate over the recommendation of the committee, but the Senate later voted for a resolve for an investigation by the Department of Public Utilities. When the matter came before the House the ways and means committee reported in favor of the investigation, but when the resolve came up in the House Representative Keegan and the other spokesmen for the carmen and labor were able to swing the House for the bill over the objection of the ways and means committee. The bill now goes back to the Senate.

**Cancellation of Commutation Asked.**—The San Diego Electric Railway, San Diego, Cal., has applied to the Railroad Commission jointly with the San Diego & Coronado Ferry Company for authority to cancel the present monthly commutation ticket between San Diego and Coronado, which is sold at the rate of $4. It is alleged that since the weekly passes were installed on the San Diego Electric Railway by authority of the Railroad Commission the sales of commutation tickets do not justify the cost of printing them.

**Fares Higher in Rhode Island.**—The United Electric Railways, Providence, R. I., on June 1 introduced an 8-cent cash fare or a token rate of 7 cents. From Pawtucket to Providence a distance of four miles, the fare is sixteen cents. From Pawtucket to Cumberland, six miles, the fare amounts to thirty-two cents.

**Buses to Replace Railway for Trial Period.**—The City Council of Oskaloosa, Iowa, has passed a resolution which permits the Oskaloosa Traction & Light Company to operate motor buses instead of street cars. M. G. Linn, local manager of the Illinois Power & Light Company at Oskaloosa, which controls the railway there, has explained that the bus service is to be a trial, subject to the restoration of the railway service, if the citizens desire it. Better service with buses than with street cars is promised by the company. There are 8 miles of electric railway in Oskaloosa.

**Bus Franchise Granted.**—The City Council of Jamestown, N. Y., has granted a twenty-year bus franchise to the Jamestown Motor-Bus Transportation Corporation, a recently formed subsidiary of the Jamestown Street Railway. The franchise calls for operation at an 8-cent fare and a 7-cent ticket charge. Transfers are free from bus to bus, but cost 3 cents from bus to trolley. Bus service on the north and south side of the city, which was discontinued early this winter, is to be resumed within three months.

**Complaints Dismissed.** — Complaints of the cities of Oakland, Berkeley, and San Leandro, against the Key System Transit Company, successor of San Francisco-Oakland Terminal Railways, alleging discrimination in the matter of school children's fares in favor of the city of Richmond, have been dismissed by the California Railroad Commission. The alleged discrimination was removed through acceptance by the company of uniform school children fares in the East Bay district as recommended by the commission.

# Financial and Corporate

## $863,646 Net for Detroit United

### President Stevenson Optimistic—Has Important Expansion Program Under Way—Doesn't Fear Buses

The Detroit United Railway, Detroit & Port Huron Shore Line Railway, Detroit, Monroe & Toledo Short Line Railway, Detroit, Jackson & Chicago Railway and the Detroit United Railway Trucking Company report income for the year ended Dec. 31, 1923, of $863,646 before making provision for depreciation or contingencies transferred to surplus account.

STATEMENT OF EARNINGS OF DETROIT UNITED RAILWAY AND SUBSIDIARY COMPANIES FOR THE YEAR ENDED DEC. 31, 1923

| | | Amount |
|---|---|---|
| Gross earnings from operations: | | |
| Passenger | | $7,257,895 |
| Freight and express | | 1,548,389 |
| Mail | | 19,194 |
| Special car | | 38,121 |
| Total gross, earnings from operations | | $8,863,599 |
| Deduct—Operating expenses before providing for depreciation | | 7,243,271 |
| Net earnings from operations | | $1,620,328 |
| Add—Proportion of interest received with respect to balance owing by city of Detroit for purchase of company's city properties | $220,832 | |
| Other income | 652,751 | 873,583 |
| Gross income, less operating expenses | | $2,493,911 |
| Deduct—Interest on funded and floating debt | $1,789,387 | |
| Less—proportion of interest received with respect to balance owing by city of Detroit credited upon the books of the company to interest on funded debt | 732,787 | $1,056,600 |
| Taxes | | 573,665 |
| Together | | $1,630,265 |
| Balance—Income for the year before making provision for depreciation or contingencies transferred to surplus account | | $863,646 |

President Elliot G. Stevenson has reviewed at considerable length the affairs of the company, particularly details with regard to transactions conducted with the city over the purchase of the lines. He says that his statement as to the ability of the company to continue to pay dividends at the present rate is based not upon speculations but upon facts that seem to him to warrant the forecast. He says it must be borne in mind that during 1923 there was a large increase in the rate of wages of platform men and other employees. This increase in the wages of the men became effective, by agreement, on Aug. 1, 1923, but the increases were made retroactive to May 1, 1923. These increases are reflected in the operating costs of the company for 1923. They aggregate $400,000.

It was not until the end of 1923, says Mr. Stevenson, that the company got any relief by way of increases in rates of fare to compensate for this increased expense. Indeed, as to the Rapid Railway, one of the company's principal properties, the new rate had not become effective on March 18 this year. From experience to date, as to passenger traffic carried and revenues received therefor, the indication is that the increase in the passenger revenue from the increased rate of fare will amount to about $600,000, more than double the amount of the profits that are being realized on the city purchase contract.

In addition the company has formulated plans to alter, in some important respects, its present method of operation and confidently expects that this change will save the company from $300,000 to $500,000 a year. It will take from three to six months to give effect to these plans.

Mr. Stevenson says that he does not, in any way, wish to minimize the effects of bus competition, but with an experience now extending over nearly two years in dealing with this competition, he feels that it is not going to defeat the expectations of the company of profitable operation of its properties.

### IMPORTANT FREIGHT PLANS UNDER WAY

The statement is made that the company has under consideration the development, principally by the construction of some new connecting lines, of another source of revenue that promises to be almost, if not quite, as important as the passenger revenue. The reference is to revenue from express and freight, the increased profits from which will, Mr. Stevenson believes, more than offset any reduction in passenger revenue due to bus competition. During the year 1923 the revenues of the company from this source amounted to $1,548,388. When certain financing, referred to in detail in the report, has been completed, the company will have available about $2,500,000 to provide for needed extensions—filling in gaps. Mr. Stevenson is confident that the revenue from freight and express traffic will be doubled within a year. He says that the study and formulation of the plans in this connection have consumed much time, but that they are now well matured and ready to be carried forward to execution. Limitations of space prescribed by the annual report prevented him from telling the story in detail.

TRACK MILEAGE OF DETROIT UNITED RAILWAY DEC. 31, 1923

| | 1923 | 1922 | Increase |
|---|---|---|---|
| Detroit United Railway | 264.3645 | 260.2763 | 4.0882 |
| Rapid Railway System | 142.8816 | 142.8375 | 0.0441 |
| Detroit, Monroe & Toledo Short Line Railway | 84.8458 | 84.0946 | 0.7512 |
| Detroit, Jackson & Chicago Railway | 111.6987 | 111.6782 | 0.0205 |
| Total | 603.7906 | 598.8866 | 4.9040 |

PASSENGER STATISTICS OF DETROIT UNITED RAILWAY, YEAR 1923

| | |
|---|---|
| Revenue passengers carried | 53,671,114 |
| Free transfers | 3,895,242 |
| Employees | 930,785 |
| Total | 58,497,141 |
| Receipts per revenue passenger | 13.52 cents |
| Receipts per total passenger | 12.41 cents |

MILEAGE STATISTICS OF DETROIT UNITED RAILWAY, YEAR 1923

| | |
|---|---|
| Revenue car mileage | 18,999,260 |
| Earnings per car-mile | 46.65 cents |
| Expenses per car-mile | 38.12 cents |
| Net earnings per car-mile | 8.53 cents |

## $105,000 Offered for Charleston-Isle of Palms Property

Peronneau R. Rivers, special master for the Charleston-Isle of Palms Traction Company, Charleston, S. C., recently offered the property at public auction. Confirmation of the sale appears to depend on purchase by the ferry commission of the two old steamboats and two wharves and the bridge connecting Mount Pleasant with Sullivan's Island.

J. D. Ernest Meyer offered $15,000 for the purely railway property. As chairman for the ferry commission, John P. DeVeaux offered $105,000 for parcel No. 1, two steamboats, two wharves and a bridge, provided the commission is declared to have authority for proceeding.

Arthur R. Young, offered $20,000 for parcel No. 2, the electric railroad and its appurtenances, provided the ferry commission purchase parcel No. 1. Mr. Young also offered $23,000 for parcel No. 3, the lighting plant, provided the ferry commission purchase parcel No. 1. Mr. Young, again acting for others, offered $2,000 for some real estate holdings.

The Charleston-Isle of Palms Traction Company has not been operating since the Sheriff of Charleston County took custody of the ferry boats because of non-payment of a verdict for damages.

The pavilion and some other properties at the Isle of Palms, the terminus of the electric railway, are not owned by the traction company.

It has been reported for some time that the Cooper River Ferry Commission was planning to make a bid for the two boats, and for the wharves and bridge. Meanwhile, the constitutionality of the act creating the commission is before the courts.

## 1924 Quarter of New York State Line Shows Improved Net

Increased profits for the quarter ended March 31, 1924, compared with the same period a year ago are shown in the official report of the New York State Railways, Syracuse, N. Y. A net income of $331,735 is shown, after interest, rents and other charges had been deducted. This is equivalent after the payment of preferred dividends to $1.42 a share on the $19,952,400 common stock outstanding. The net income figure for the same quarter a year ago was $274,302, or $1.13 a share on common stock. Operating revenues were $2,993,567 for the March, 1924, quarter. The operating expenses for the first quarter of the present year were $2,053,467. Lower taxes and lower non-operating income debit are factors in the increased net income.

## Augusta Railway's Note Extension Requested

The Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., through President Brown, has requested an extension of notes in a letter to the holders of the 5 per cent bonds and the 5 per cent notes, due June 1, 1924. He states that payment of interest on bonds can now be resumed provided the payment on notes is extended, into which the coupons were funded. He reminds the holders that five years ago and again two years ago they were requested to defer interest on their bonds by funding the coupons into an interest bearing note maturing this June. Holders of nearly 94 per cent of the bonds outstanding in the hands of the public agreed to this request. By their action he said the corporation had been brought through the difficult years following the war without receivership, and that out of the earnings the bank loans of $160,000 had been liquidated, and cash had been provided for necessary capital expenditures aggregating $540,000 for the five years.

He said though that some $722,000 of the notes were still outstanding. As a consideration for the extension it was proposed to pay interest on these notes at the rate of 6 per cent per annum instead of 5 per cent per annum as before. The extension is to be until Dec. 1, 1935, when the bonds fall due. He said that both securities could then be provided for by the same funding operation. Large bondholders had been consulted by the directors and had approved the extension, and agreed to co-operate in carrying the plan to completion. He said further that when sufficient notes had been deposited the extension would be declared effective, and there would be issued, instead of the deposited notes, bonds dated June 1, 1924, and maturing Dec. 1, 1935, carrying 6 per cent interest payable semi-annually and callable at any time at par and interest and secured by deposit of funded coupons.

## Offer Made for American Electric Power Properties

The American Gas & Electric Company and the Appalachian Power Company are seeking control of the American Electric Power Company. Van Horn Ely, president of the American Electric Power Company, announced on May 29 that a contract had been signed whereby the two companies named have agreed to buy the common shares of that company at $62.50 a share.

The agreement provides that the contract will be binding if within fifteen days certain representations by the vendors are verified to the satisfaction of the purchasers, and also that not less than 75 per cent of the 189.200 shares of outstanding common stock of American Electric Power is deposited for delivery to the purchasers against payment. It is further said that a separate company may eventually acquire the electric railway lines of the American Electric Power Company.

The American Electric Power Company succeeded the American Railways Company, which was incorporated in New Jersey in 1900, representing a consolidation of the old American Railways Company and the United States Electric Railway & Light Company. It has an authorized capital of $17,000,000 common stock and $8,000,000 preferred.

## Lake Shore Electric Railway Has Surplus

A surplus of $172,461 in 1923 was realized by the Lake Shore Electric Railway System, Cleveland, Ohio. In 1922 the surplus was $175,053. These facts are contained in the twenty-third annual report. The system comprises the Lake Shore Electric Railway, the Lorain Street Railroad, the Sandusky, Fremont & Southern Railway, the People's Light & Power Company and the Bellevue Illuminating & Power Company. By far the biggest part of the system is the Lake Shore Electric Railway, which alone spent $155,709 for additions and improvements chargeable to capital account. The first consolidated 6 per cent bonds of this company, $1,600,000 par value, matured on Jan. 1, 1923, and were extended for ten years at 6 per cent.

STATEMENT OF EARNINGS OF LAKE SHORE ELECTRIC RAILWAY ALONE

| | 1923 | 1922 |
|---|---|---|
| Gross earnings | $2,235,662 | $2,064,608 |
| Operating and taxes | 1,709,889 | 1,548,530 |
| Net earnings | $525,772 | $516,078 |
| L. & C., T. F. & N. and 1st cons. interest | 205,975 | 191,475 |
| | $319,797 | $324,603 |
| All other interest | 135,024 | 136,468 |
| Surplus | $184,773 | $188,134 |
| Per cent of operation | 76.48 | 75.05 |
| Car-miles | 4,055,508 | 3,770,237 |
| Income per car-mile | 55.12c | 54.76c |
| Operating and taxes per car-mile | 42.16c | 41.07c |
| Net earnings per car-mile | 12.96c | 13.69c |
| Passengers carried | 6,967,058 | 6,963,861 |
| Earnings per passenger | 22.03c | 21.64c |

Of the total gross earnings of $2,235,663 in 1923 the Cleveland division contributed $1,102,383, the Toledo division $916,885, the Sandusky-Norwalk division $55,989 and the city lines $160,406. Total passenger revenue for the year was $1,521,283 against $1,493,255 for the year previous. The biggest item included in operating expenses was for transportation, which amounted to $542,677, an increase of $68,308 over transportation expenses in 1922.

An evidence of the company's growth in business is seen in the comparative statement of gross earnings from 1902 to 1923. In 1902 the gross earnings were $466,051 and have been steadily increasing in practically every year up to 1923, when they were $2,235,663. It is to be noted that the banner year was 1920, when the gross earnings totaled $2,699,342.

The Lorain Street Railroad, a subsidiary of the Lake Shore Electric Railway System, carried 3,676.080 passengers in 1923, against 2,899,331 in 1922. The company finished the year, however, with a deficit of $33.441. The deficit the year before was $33.958.

The Sandusky, Fremont & Southern Railway carried 293.500 passengers in 1923 against 299,551 in 1922. Operation on that property resulted in a deficit in 1923 of $25,609 against $19,338 in 1922.

## $400,000 of Notes Sold Direct in Four and a Half Days

The Galveston-Houston Electric Company, Houston, Tex., recently sold, locally, $400,000 of 7 per cent bond secured notes, as a means toward improving public relations and at the same time raising money to expand the street railway system in Houston. The improvements to be made are in accordance with a recent agreement between the city and the company, under which jitneys were eliminated, and certain improvements are to be made in the railway system.

The notes were issued in $100, $500 and $1,000 denominations. They were sold at par and accrued interest, either for cash or on the partial payment plan.

The partial payment plan was open to the public as well as to employees, but different methods were used in handling the accounts. The public was allowed to make ten monthly payments, the first to be paid when the notes were ordered. They were also allowed interest at the rate of 6 per cent until the principal had been paid in full, and 4 per cent if the order is concelled before making final payment. Employees were allowed to make twenty semi-monthly payments with installments deducted from the payroll checks and an allowance of interest at 7 per cent until final payment. Even if the employees subscription is cancelled before final payment is made by him he is allowed 7 per cent interest.

On the first day of the sale, meetings of all employees were held, the issue explained in detail, orders taken from members of the company, and all were urged to assist in promoting the sale of the notes. The trainmen were very active in talking to friends and passengers and other employees to people with whom they came in contact. In this manner, the names and addresses of prospective buyers were obtained, turned in to the office and some one sent to see each individual. When possible the person securing the prospective customer was allowed to complete the sale if possible. This method served a double purpose, that of stimulating the interest of the employee in the affairs of the company and also affording a quick follow-up system.

Advertising of the note sale was done by the company and a few of the local brokers. Company advertising was carried out by mailing circulars to 20,000 telephone users, stating the purpose of the issue and showing the financial status of the company, and by means of newspaper ads and news items, car ads—both dash signs and cards on inside of cars—and handbills distributed on the cars. In addition to this advertising, several local brokers ran notices of the sale in their regular advertising space.

The entire issue was sold in four and one-half selling days. Statistics showing the distribution of notes sold follow:

| | Number | Amount |
|---|---|---|
| Public bought for cash | 248 | $333,400 |
| Public bought on partial payment | 118 | 7,000 |
| Employees bought for cash | 30 | 12,500 |
| Employees bought on partial payment | 450 | 71,700 |
| Total | 846 | $424,600 |

## New York & Harlem Has Deficit in First 1924 Quarter

It was brought out at the annual meeting of the New York & Harlem Railroad, New York, N. Y., that for the first quarter of 1924 the operation of the surface lines had produced a deficit of $7,169. In 1923 the deficit was $71,931. The total deficit since the return of the lines to their owners by the New York Railways on Feb. 1, 1920, is $311,769.

An agreement was reached with the receiver for the New York Railways entitling the company to have thirteen cars additional to 156 delivered to it on Feb. 1, 1920, besides additional material.

The claims of the company against the New York Railways aggregating more than $1,300,000 are on file with the receiver, but it is considered unlikely that any funds will be available from the sale of the New York Railway's property for distribution to general creditors. The reorganization plan of the New York Railways approved recently by the court does not contemplate the inclusion of the Harlem lines, but it is stated that securities of the new company may be reserved for such acquisition later.

The company owes the city special franchise taxes from 1920 to 1923 inclusive, amounting to $235,017. The company has paid $225,244 taxes accrued prior to Feb. 1, 1920, and left unpaid by the lessee, and $137,059 in taxes subsequent to that date. It has borrowed and now owes $912,000. Including that item total current liabilities on March 31 last were $1,936,597, against total current assets on that date of $668,326.

## Winona Interurban Sold to Bondholder

The Winona Interurban Railway, extending a distance of 70 miles between Goshen and Peru, Ind., was sold on May 29 at a receiver's sale in Elkhart, Ind. James P. Goodrich, former Governor of Indiana, who held about 95 per cent of the outstanding bonds, was the only bidder. The property will be taken over immediately by the Winona Service Company, organized by Mr. Goodrich, his son Pierre and Samuel J. Mantel, a law clerk. The company is incorporated with 10,000 shares of no par value stock. As indicated previously in the ELECTRIC RAILWAY JOURNAL it is proposed to tie in the road with the lines of the Interstate Public Service Company for through operation of trains from Louisville through Indianapolis to South Bend and Chicago.

## Net Income of Detroit Street Railways Increases in April

For the thirty days ended April 30, 1924, the City of Detroit, Department of Street Railways, reports a total revenue from transportation of $1,918,766, against $1,693,924 for the similar period in 1923. The total operating revenue, including that derived from the transportation, rent of track and other miscellaneous sources, was $1,961,012 in April, 1924, and $1,794,327 in April, 1923. Expenses for the month of April showed an increase, being $1,299,077 in 1923 and $1,388,299 in 1924. The net revenue was $572,713 in April, 1924, against $495,250 in April, 1923. The net income increased from $80,978 in April, 1923, to $99,969 in April, 1924. The number of passengers carried in April of this year was 41,228,817, while in April a year ago 41,685,537 passengers were carried.

**Declares Lines Unprofitable.**—In a statement before the Public Utilities Commission of Maine M. A. Williams, manager of the Portland Railroad, Portland, Me., operated under lease by the Cumberland County Power & Light Company, asserted that the Old Orchard and Saco lines were unprofitable and should be abandoned. At the same time the commission heard the petition of the Checker Cab Company for a bus license to operate to Old Orchard.

**Rehabilitated Road Doing Well.**—At a meeting of the directors of the New Haven & Shore Line Railway held in New Haven recently, the treasurer's reports showed the financial condition of the road to be very satisfactory. The committee which was appointed to investigate for the spur track into Hammonasset Park appeared before the Public Utilities Commission recently in Hartford. The commission has changed the original layout and after the park commission approves of this arrangement the work of tracking will begin at once. The company has been operating since July 17, 1923, the rehabilitated portion of the Shore Line Electric Railway from New Haven to Madison, Guilford and Saybrook.

**Public Benefits $6,343,000.**—The total tax bill of the Chicago Surface Lines, Chicago, Ill., this year, including the city's 55 per cent of the net receipts, amounts to nearly $5,000,000, according to an announcement made by G. A. Richardson, vice-president of the lines. Other public benefits, such as street paving, maintenance and cleaning of pavement, bring the total up to more than $6,343,000 for the year ended Jan. 31, last.

**Tax Arrears Met.**—The Public Service Railway's tax arrears for Newark, N. J., for 1917 and 1918 were cleared up recently by the payment of $190,558. The check represented a personal property tax of $158,182 and interest of $37,376, figured at a compromise rate of 4½ per cent.

**Accumulated Surplus $16,938.**—The Petaluma & Santa Rosa Railroad, operating from Petaluma, Sebastapol, Santa Rosa, Forestville, reports to the California Railroad Commission for the year 1923 that its operating revenue was $593,865, and operating expenses $440,885, giving a net operating revenue of $152,980. Interest, rent, taxes and other deductions totaled $103,365. The net corporate income for the year was $87,719. The surplus at the beginning of the year amounted to $8,224. Miscellaneous additions to surplus for 1923 amounted to $10,496 and miscellaneous deductions were $55,884. The company declared dividends of $33,616 during the year, leaving an accumulated surplus at the end of the year of $16,938.

**Short Brooklyn Line Discontinued.**—The old Montague Street surface line in Brooklyn has been discontinued under an order signed by Federal Judge Julius M. Mayer. Representations were made to the court that this line carried only about 150 passengers a day and was being operated at a loss of about $6,000 a year. The line runs from Court and Montague Streets to the old Montague Street ferry, a distance of about one-third of a mile. It is the last line operated by the Brooklyn Heights Railroad and virtually ends the receivership, which, however, will be continued until after proper legal proceedings have been carried out for its discharge.

**Seeks Abandonment Permission.**—Application has been made by the Peekskill Lighting & Railroad Company for approval by the Public Service Commission of its plan to abandon part of the railway system beginning on East Main Street in Peekskill, N. Y., and terminating at the end of the road on Five-Mile Turnpike, in Yorktown. The petition sets forth that the village of Peekskill desires to improve East Main Street. The improvement would cost $17,250, it is estimated, and the railway asserts that the travel on the line does not warrant the expenditure.

**Piedmont Power & Light Absorbed.**—The North Carolina Public Service Company, Inc., Greensboro, N. C., one of the subsidiaries of General Gas & Electric Corporation, has purchased outright all the property of the Piedmont Power & Light Company, operating in Gibsonville, Elon College, Burlington, Graham, Haw River, Relbano and adjacent territory. In February, 1924, the General Gas & Electric Corporation purchased the North Carolina Public Service Company. This was the first entry into North Carolina of the General Gas & Electric Corporation.

**Will Vote on Sale.**—The stockholders of the Jackson Railway & Light Company, Jackson, Tenn., will vote on June 23 on authorizing the sale of all the assets, properties and franchises of the company.

**City Joins in Valuation Work.**—The city of Fort Smith has decided to join the Fort Smith Light & Traction Company, Fort Smith, Ark., in making a valuation of all the properties in the city, including traction lines, electric and gas distribution, preliminary to possible rate changes. Burns & McDonnell, consulting engineers of Kansas City, have been employed by the city to work with the valuation engineers of the company in making a complete inventory of all the physical properties.

**Defunct Line Bought.**—The Pennsylvania & Ohio Traction Company, which ceased operation this winter, has been sold to Jacob Levine & Sons Company, junk dealers of Newcastle, Pa. The purchase price was $46,115. The company owned and operated the trolley line between Connaught and Jefferson, through Ashtabula. The sale included all of the personal property, including practically all the equipment. When the commission authorized discontinuance on the line this past winter it found that for the past five years the company had had a loss of more than $100 a day.

# Legal Notes

DISTRICT OF COLUMBIA — *Automobile Driver May Assume Car Will Stop at Regular Stopping Place Where Passengers Are Waiting.*

The driver of an automobile saw a car approaching but expected it would stop at the regular stopping point, where passengers were waiting. The motorman did not do so, whether he was behind time or the car was fully loaded does not matter. He should have kept his car under control in such circumstances and the company was held responsible for the resulting collision. [George vs. Capital Traction Co., 295 Federal Rep., 965.]

FEDERAL COURTS — *Railroad Not Obligated to Pay Wages Under "National Agreement," as Modified by Labor Board.*

The "national agreement" between the railroads and their employees as to wages, etc., and the modifications thereof by the Railroad Labor Board, when accepted by a railroad, cre an implied contract to pay its employees accordingly. But as there is no agreement to continue these payments for any specified time, when the railroad reduced the wages, and these wages were accepted by individual employees, there was no contract or legal obligation on the company to pay higher wages. [Pennsylvania R.R. Federation No. 90, v. Pennsylvania R.R., 296 Federal Rep., 220.]

INDIANA—*Duty of Traveler at a Railway Crossing.*

The track at a railroad crossing is a warning of danger, whether the cars are operated by electricity or steam. One crossing such a track must use his eyes and ears, he must stop within a place of safety if a train is approaching and he must exercise ordinary care. [Guion vs. Terre Haute, Indianapolis & Eastern Traction Co., 143 N. E. Rep., 20.]

IOWA—*Damages Caused by Negligence Separable from Damages Non-Recoverable.*

Where an automobile, through the negligence of the driver, came into collison with a street car, the automobile owner could recover for damage caused by the motorman's negligence in backing his car after the collision, provided he could separate the amount of damages so sustained from the damages caused by the collision. [Tesdell vs. Des Moines City Railway, 197 N. W. Rep., 629.]

NEW JERSEY—*Utilities Board May Enjoin Unlawful Operation of Jitney.*

Where a state act requires the approval of the utilities board for the operation of a bus line, which is parallel to a railway line, the order of the board to the jitney line to cease operation is enforcible. The board may choose its remedy in law or equity, whichever may more speedily and effectively produce relief. Consequently, it is entitled to an injunction. [Board of Public Utility Commissioners vs. Sheldon et al, 124 Atlantic Rep., 65.]

NEW JERSEY—*Company Liable to Passenger Injured When Ejecting Fellow Passenger at Conductor's Request.*

A conductor called upon a passenger to aid him in ejecting a negro passenger, but after the latter drew a knife, the conductor withdrew from the attempt, and the assisting passenger was injured. The company was held liable. [Frazier vs. Public Service Railway, 123 Atlantic Rep., 867.]

NEW YORK—*City Track Employee May Be Engaged in Interstate Commerce.*

An employee was injured while putting in and tightening up bolts on a section of city track. The railway company sells through tickets good over its lines to Queenston, Canada, and it is possible for a passenger with one of these tickets to transfer to the city line on which the employee was injured. The Appellate Division held the employee was engaged in interstate commerce. [Borelli vs. International Railway, 203 New York Sup., 704.]

NEW YORK — *Determination of Status as Passenger of Person Assaulted.*

Where a motorman assaulted a person who had placed his foot on the first step of the car and was about to board it, the Appellate Division held that the jury should decide whether the plaintiff was a passenger. [Supple vs. International Railway, 203 New York Sup., 749.]

NEW YORK — *Action Where Engineer Refused to Give a Contractor a Certificate of Satisfaction with Work Performed.*

This case related to construction on a street railway, on which about $30,000 was paid upon progress certificates and $16,000, the balance on the contract, was refused. The Appellate Division held that in a contract requiring the work to be done to the satisfaction of the company's engineer and the work has been done substantially as required, a cause of action will lie, notwithstanding the refusal of the engineer to issue a certificate. On the other hand, the engineer's failure to object to work while it was being performed is no excuse for defective performance. [Hevenor vs. Union Railway, 204 New York Sup., 40.]

OHIO—*Assessment of Street Railway Franchise for Sewer Held Unauthorized.*

The section of the general code authorizing municipalities to levy assessments upon "specially benefited lots and lands" to pay a portion of the cost of public improvements therein named, does not authorize an assessment to pay a portion of the cost of a storm sewer to be levied upon the franchise of an electric railway occupying a portion of the streets. The railway does not have the exclusive use of the streets but uses it only in common with the public for the purposes of travel and in company with other public utilities. The rails, ties, poles, etc., do not constitute "lots or lands" within the meaning of the section. [Ohio Electric Railway vs. City of Greenville, 143 N. E. Rep., 193.]

OHIO—*Punitive Damages Not Collectible for Assault Unless Company Was Negligent in Employing or Retaining Servant.*

In an action for personal injury for an assault upon a passenger by the employee of an electric railway, punitive damages cannot be recovered against the corporation in the absence of evidence that the assault was authorized, participated in, or ratified by the corporation, or that the corporation had failed to exercise due and reasonable care in selecting or retaining its employee. [Columbus Railway Power & Light Co. vs. Harrison, 143 N. E. Rep., 32.]

PENNSYLVANIA — *Liability to Passengers Struck by Automobile When Entering or Leaving Car.*

A street railway company is not liable for the conduct of third persons who negligently injure intending passengers standing on the highway. Hence, it is not liable when such passengers are run down by an automobile in violation of law forbidding the passing of a standing car by an automobile except under special circumstances, though if the railway contributed to the accident by a very dazzling headlight or in other ways, it would be liable. [Klingensmith vs. West Penn Railways, 123 Atlantic Rep., 787.]

WEST VIRGINIA—*Failure of Motorman to Sound Warning Signal Immaterial if Driver Knew Car Was Approaching.*

An electric locomotive was waiting at a corner on a siding and a trolley car approached to pass it. As the trolley car entered the siding, the locomotive started without warning signal and struck an automobile passing from a cross street over the track. The court held that negligence of the company in this case could not be predicated on a failure of the locomotive motorman to give a warning signal if the person injured had knowledge of the approach of the locomotive in sufficient time to avoid injury. A judgment for the plaintiff was reversed and a new trial ordered. [Blackwood vs. Monongahela Valley Traction Co., 132 S. E. Rep., 359.]

WISCONSIN—*Railroad Commission May Take Paving Charges Into Consideration When Ordering Extension.*

Under the Wisconsin law the Railroad Commission has power to require a street railway to extend its line where public convenience and necessity require the extension and the construction and operation of the line will not impair the earnings of the railroad, so as to prevent an adequate or fair return. But where the city's demand that the company pay the cost of constructing the paving within the track zone on such extensions would affect the opportunity for the fair return, the commission should take this into consideration. [Madison Railways vs. Railroad Commission of Wisconsin, 198 N. W. Rep., 278.]

# Personal Items

### E. L. Graumlich Acting Commissioner in Toledo

E. L. Graumlich, engineering and operating assistant to Street Railway Commissioner W. E. Cann at Toledo, Ohio, was named by Mayor Brough and the Board of Control of Street Railways at Toledo as acting commissioner, effective June 1.

Mr. Graumlich went to Toledo at the time the Milner ordinance became effective two years ago and has had charge of both engineering and operating details in the commissioner's office. Many of the rerouting plans and schedule changes which have been put into effect were worked out by Mr. Graumlich.

Before that he was in the office of Fielder Sanders, street railway commissioner at Cleveland, Ohio. He entered the office of the commissioner there in 1917, first working on engineering projects. He was in the Coast Artillery Corps in the World War. After the war he was associated with rapid transit studies in Cleveland and with the commissioner there in charge of schedules and routes. His experience of nearly seven years has been entirely devoted to the commissioner's end of service-at-cost operation.

Mr. Graumlich is thirty-two years old. He is a graduate of the Case School of Applied Science at Cleveland.

**Hugh Gordon,** attorney for the California Railroad Commission for the last four and a half years, has tendered his resignation effective July 1. He will return to Los Angeles to resume the private practice of law. Prior to becoming attorney for the commission Mr. Gordon was assistant county counsel of Los Angeles County.

**G. C. Estill,** superintendent of way and structures of the New Orleans Public Service, Inc., has resigned to accept the position of vice-president and general manager of the new property of the Electric Bond & Share Company of New York at Miami, Fla.

**Carl I. Wheat** will succeed Hugh Gordon as attorney for the California Railroad Commission. Mr. Wheat has been assistant attorney for the past two years. Prior to becoming associated with the commission he was connected with a law firm in Los Angeles.

**Ross Luellan** has been appointed division freight and passenger agent for all the lines of the Union Traction Company from Anderson to Wabash and from Anderson to Muncie, Union City, Portland, Bluffton and New Castle. Mr. Luellan was formerly safety engineer at Anderson, Ind. In his new capacity he succeeds A. J. Hewitt, who was transferred to Indianapolis and will be division, passenger and freight agent for the Indianapolis territory.

**Charles F. Lederer** has resigned as general supervisor of rail welding of the Metal & Thermit Corporation, New York, to return as superintendent of way to the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., with which he was associated prior to joining the rail welding staff of the Metal & Thermit Corporation.

### Daniel W. Snyder Appointed Vice-President of Illinois Traction

Daniel W. Snyder, Jr., who has been general manager of the properties of the Illinois Power & Light Corporation, Bloomington, Ill., since 1916, has been promoted to vice-president and a director of the Illinois Traction System, with headquarters at Springfield, Ill. The appointment became effective June 1. Mr. Snyder has full charge of operations of the interurban system with 550 miles of track operated from Peoria, Springfield, Danville, Decatur and Bloomington to St. Louis, Mo. His jurisdiction also includes the Illinois Valley division of the system operated between Ottawa and Streator and Joliet and Princeton, Ill.

D. W. Snyder, Jr.

C. F. Handshy, for many years manager of the interurban lines of the Illinois Traction System with offices at Springfield, Ill., will continue in that capacity. F. E. Fisher, Joliet, Ill., will continue as manager of the Illinois Valley division of the road.

The selection of Mr. Snyder as one of the leading operating heads of the Illinois Traction System is in line with the policy of the company to choose men from its own ranks for the positions higher up as soon as they are qualified to hold them. He is a young man, but has already had a wide experience in the public utility field in the management of railway, power, light and gas properties.

His first position in railway work was as superintendent of the Northampton Traction Company, Easton. Pa. Later he became general manager of the Clifton Gas & Electric Company, Clinton, Ill. In 1914 he accepted the position of general superintendent of the Jefferson City Light, Heat & Power Company and Jefferson City Bridge & Transit Company at Jefferson City, Mo.

Mr. Snyder became general manager of the Bloomington properties in 1916 which are now a part of the network of utilities operated by the Illinois Power & Light Corporation in five states of the Central West. In 1923 he was president of the Illinois State Electric Association.

### E. O. Brown Made Manager at Bloomington

Edwin O. Brown, manager of the properties of the Illinois Power & Light Corporation at Galva, Ill., will succeed D. W. Snyder, Jr., as manager of that company at Bloomington, Ill.

Mr. Brown is well known in electrical activities in central Illinois. He is the son of E. L. Brown, Elmwood, Ill., a pioneer in the building of electric plants in the state. Mr. Brown entered the electric lighting business with his father at Elmwood.

In 1913 Mr. Brown and his father and those associated with them sold out their interests at Elmwood to the Hodenpyl-Hardy interests and went to Galva, Ill., where they built a plant and took over the electrical properties at Cambridge, Altona, Oneida, Victoria and LaFayette. These properties they operated until 1917, when they were taken over by the McKinley interests and Edwin O. Brown was made manager of them. In 1923 they were taken over by the Illinois Power & Light Corporation and Mr. Brown was retained as manager.

"Bud" Brown, as Edwin Brown is known, was born at Elmwood on Sept. 3, 1883. He was graduated from the Elmwood High School in 1901 and studied engineering at the University of Illinois. He entered business with his father immediately upon leaving the university in 1902.

**Elmer E. Barnard**, engineer of way and structures of the Lynchburg Traction & Light Company, Lynchburg, Va., and the Roanoke Railway & Electric Company, Roanoke, Va., has been appointed to the State Board for the Examination and Certification of Professional Engineers, Architects and Land Surveyors by Governor Trinkle. Mr. Barnard will fill out the term of office of the late Maj. Peyton B. Winfree, which expires July 15, 1928.

# Obituary

**John Emory Meek**, vice-president of Johns-Manville, Inc., New York City, died on May 24. During his active career he served seven years with the Pennsylvania Railroad at Altoona, Pa., later going to Denver, and remaining there for six years, the last three of which he was chief engineer of the power plant. He entered the employ of the H. W. Johns Company, New York City, in 1894, and went with the H. W. Johns-Manville Company on its organization in 1902. He formed the railroad and United States government departments of this company in 1906, and he'd the position of general manager until March, 1924, when he was promoted to vice-president.

# Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

## Mr. Hoover Urges Coal Storage

### Secretary of Commerce Makes Plea for Co-operation in Handling Traffic Similar to That in 1923

Coal is again causing government officials concern. It is not the conditions in the coal industry itself to which department heads are now paying special attention, but the apparent indifference of industry in general to the need for anticipating the writer's requirements sufficiently ahead of the fall traffic movement to avoid a possible car shortage. During 1923 the railways through the co-operation of the manufacturing and distributing trades and the coal operators and distributors were able to handle the national coal traffic in a most efficient manner without car shortages. This was accomplished to a considerable degree by co-operation among the trades for the purchase and storage of coal during the summer season. The great danger point of traffic congestion, of course, is the fall season when the combined crop, winter goods, and household coal movements have always, except through last year's co-operation, combined to create a car shortage.

The fall car shortage always has the effect of increasing the price of coal and of seriously disturbing the whole economic machine. In this connection Herbert Hoover, Secretary of Commerce, points out that security lies in repeating the storage performance of last year, by the manufacturers of the country taking reserves of coal during the months of May, June and July, thus foregoing the necessity of coal shipments during the peak period in competition with the household movement. Outside of strike years, these summer months are universally the period in which lowest bituminous coal prices prevail.

Mr. Hoover has pointed out publicly that the country has a national problem before it in the matter of securing cheaper coal by maintaining more regularity in the production of coal mines through planning out its seasonal fluctuations. He says that this can only be brought about if the consumers are willing to store coal during the low production season.

These considerations Mr. Hoover has reiterated in a letter to the Secretary of the American Electric Railway Association in which he says there is, therefore, every transportation and financial reason for storing coal during the next few months in preparation for the autumn need. He considers it would be a contribution not only in the interest of the consumer but of the railways and the coal industry if the same successful results could be produced this year that the American Electric Railway Association so materially assisted in bringing about last year.

The association in turn is seeking to bring these matters to the attention of the large coal consumers from the point of view of their personal interest as well as a contribution to the mutual good of American business.

## Soft Coal Production Lags

The average daily rate of soft coal production has remained for the last several weeks close to the lowest level touched during the entire period for which records exist, excepting only the period during the strikes of 1919 and 1922. Production of bituminous coal for the first 124 working days of the present year was 190,473,000 tons. For the same period during 1923 it was 218,591,000 tons.

There is some evidence that the rate of coal consumption is now somewhat lower than it was in the last quarter of the last year, when coal was being burned and exported at a rate of 10,200,000 tons a week. It is not probable, however, that it has fallen to so low a level as has production, which was only 7,155,000 tons for the week ended May 24. This was 35 per cent below the corresponding week a year ago. It follows, therefore, that consumers must be drawing quite heavily upon their stocks and stores.

## General Electric Bookings Hold Up Well

Bookings of the General Electric Company, Schenectady, N. Y., during April and May have been at the rate of approximately $5,500,000 a week. New orders for the second quarter are expected to about equal those of the first, when new business taken on totaled $73,487,903, or about 5,650,000 a week. Bookings for the first six months of this year are expected to reach approximately $145,000,000, or at an annual rate of $290,000,000, which would compare with $304,199,746 actually booked in 1923 and $200,194,294 in 1922.

The company entered 1924 with $87,112,000 of unfilled orders. By June 30, if bookings for the six months reach $145,000,000, orders in the company's hands since Jan. 1, upon which it could work, would be $232,112,000.

## Railway Bus Market Strong

B. A. Hegemen, Jr., president National Railway Appliance Company, New York, which is the Eastern selling agent for the Yellow Coach Manufacturing Company and sells buses exclusively to railways and railroads or to strictly non-competitive independent operators, reports that the demand for buses is very active. Mr. Hegemen states that there is a market for more buses than he can supply and that sales in this department of the Appliance company would be much larger if more buses were available.

## Trade Statistics Discussed

A conference was recently held in Washington, D. C., between the new Attorney-General of the United States

## ELECTRIC RAILWAY MATERIAL PRICES—JUNE 3, 1924

### Metals—New York

| | |
|---|---|
| Copper, electrolytic, cents per lb. | 12.75 |
| Lead, cents per lb. | 7.00 |
| Nickel, cents per lb. | 27.00 |
| Zinc, cents per lb. | 5.725 |
| Tin, Straits, cents per lb. | 40.875 |
| Aluminum, 98 to 99 per cent, cents per lb. | 27.50 |
| Babbitt metal, warehouse, cents per lb.: | |
| Fair grade | 60.00 |
| Commercial | 28.00 |

### Bituminous Coal

| | |
|---|---|
| Smokeless mine run, f.o.b vessel, Hampton Roads | $4.45 |
| Somerset mine run, Boston | 2.25 |
| Pittsburgh mine run, Pittsburgh | 1.875 |
| Franklin, Ill., screenings, Chicago | 2.175 |
| Central, Ill., screenings, Chicago | 1.90 |
| Kansas screenings, Kansas City | 2.50 |

### Track Materials—Pittsburgh

| | |
|---|---|
| Standard Bessemer steel rails, gross ton | $43.00 |
| Standard open hearth rails, gross ton | 43.00 |
| Railroad spikes, drive, Pittsburgh base, cents per lb. | 2.95 |
| Tie plates (flat type), cents per lb. | 2.52 |
| Angle bars, cents per lb. | 2.75 |
| Rail bolts and nuts, Pittsburgh base, cents, lb. | 4.00 |
| Steel bars, cents per lb. | 2.20 |
| Ties, white oak, Chicago, 6 in. x 8 in. x 8½ ft. | $1.70 |

### Hardware—Pittsburgh

| | |
|---|---|
| Wire nails, base per keg | 2.90 |
| Sheet iron (28 gage), cents per lb. | 3.60 |
| Sheet iron, galvanized (28 gage), cents per lb. | 4.80 |
| Galvanized barbed wire, cents per lb. | 3.70 |
| Galvanized wire, ordinary, cents per lb. | 2.65 |

### Waste—New York

| | |
|---|---|
| Waste, wool, cents per lb. | 15 |
| Waste, cotton (100 lb. bale), cents per lb.: | |
| White | 12–18 |
| Colored | 9–14 |

### Paints, Putty and Glass—New York

| | |
|---|---|
| Linseed oil (5 bbl. lots), per gal. | $0.97 |
| White lead (100 lb. keg), cents per lb. | 12.25 |
| Turpentine (bbl. lots), per gal. | $0.84 |
| Car window glass (single strength), first three brackets, A quality, discount* | 84.0% |
| Car window glass (single strength), first three brackets, B quality, discount* | 86.0% |
| Car window glass (double strength) all sizes, A quality, discount* | 85.0% |
| Putty, 100 lb. tins, cents per lb. | 4–6 |

*These prices are f.o.b. works, boxing charges extra.

### Wire—New York

| | |
|---|---|
| Copper wire base, cents per lb. | 15.25 |
| Rubber-covered wire, No. 14, per 1,000 ft. | $6.35 |
| Weatherproof wire base, cents per lb. | 17.25 |

### Paving Materials

| | |
|---|---|
| Paving stone, granite, 4x8x4, f.o.b. | |
| Chicago, dressed, per sq.yd. | $3.60 |
| Common, per sq.yd. | 2.95 |
| Wood block paving 3½, 16 treatment, N. Y., per sq.yd. | 2.56 |
| Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots | 53–54 |
| Crushed stone, ¾-in., carload lots, N. Y., per cu.yd. | 1.85 |
| Cement, Chicago consumers' net prices, without bags | 2.20 |
| Gravel, ¾-in., cu.yd., f.o.b. N. Y | 1.75 |
| Sand, cu.yd., N. Y | 1.00 |

### Old Metals—New York and Chicago

| | |
|---|---|
| Heavy copper, cents per lb. | 10.25 |
| Light copper, cents per lb. | 8.50 |
| Heavy brass, cents per lb. | 6.00 |
| Zinc, old scrap, cents per lb. | 3.75 |
| Yellow brass, cents per lb. (heavy) | 6.00 |
| Lead, cents per lb. (heavy) | 5.625 |
| Steel car axles, Chicago, net ton | $16.25 |
| Cast iron car wheels, Chicago, gross ton | 16.25 |
| Rails (short), Chicago, gross ton | 16.75 |
| Rails, (relaying), Chicago, gross ton | 26.50 |
| Machine turnings, Chicago, gross ton | 7.25 |

and lawyers interested in trade association activities. The Attorney-General gave no indication concerning any conclusions he may have formed on the subject of trade statistics and association activities, but intimated that he will make a careful study of this matter. It is planned to hold other conferences for the discussion of this subject.

## *Rolling Stock*

**Arkansas Central Power Company, Little Rock, Ark.,** has asked for bids on eight double-truck, double-end, lightweight city passenger cars. Specifications include four 35-hp. motors, total weight 30,000 lb. and seating capacity for forty-four passengers.

**Pacific Electric Railway, Los Angeles, Cal.,** has specified the details for the 50 closed passenger cars and 5 electric locomotives recently ordered.

| | |
|---|---|
| Date order was placed | March 22 |
| Builder of car body | J. G. Brill Company |
| Seating capacity | 65 |
| Total weight | 57,800 lb. |
| Bolster centers, length | 29 ft. 0 in. |
| Length over all | 52 ft. 2 in. |
| Truck wheelbase | 6 ft. 0 in. |
| Width over all | 9 ft. 1¾ in. |
| Height, rail to trolley base | 10 ft. 11½ in. |
| Body | All-steel |
| Interior trim | Cherry |
| Headlining | Agasote |
| Roof | Arch |
| Air brakes | Westinghouse type SME |
| Armature bearings | Friction |
| Axles | 4½ in. diam. A. S. T. M. Spec. A19-21 |
| Bumpers | Channel iron |
| Car signal system | Faraday |
| Car trimmings | O. M. Edwards and St. Louis |
| Center and side bearings | St. Louis |
| Control | Westinghouse H. L. multiple unit |
| Couplers, | Westinghouse automatic air and electric |
| Curtain fixtures, | Curtain Supply Company ring type |
| Curtain material, | Pantasote color 86 pattern "J" |
| Destination signs | Hunter illuminated |
| Door operating mechanism | Consolidated |
| Wheelguards | Eclipse type F |
| Gears and pinions | Nuttall grade BP helical |
| Hand brakes | Miner Ideal |
| Heater equipment | Consolidated truss plank |
| Headlights | Crouse-Hinds type Z |
| Journal bearings | Friction |
| Journal boxes | Symington semi-steel |
| Lightning arresters | Westinghouse |
| Motors, | 4 Westinghouse No. 532, inside hung |
| Registers | Ohmer |
| Sanders | St. Louis, air operated |
| Sash fixtures | O. M. Edwards |
| Seats | Hale-Kilburn type 400-A |
| Seating material | Pantasote, Spanish finish |
| Slack adjuster | Westinghouse |
| Springs | Railway Steel Spring Company |
| Step treads | Feralun |
| Trolley retrievers | Ideal |
| Trolley base | U. S. No. 13 |
| Trolley wheels | Kalamazoo No. 23 |
| Trucks | Commonwealth cast steel |
| Ventilators, | Automatic type ARDM Consolidated |
| Wheels | 24-in. Griffin F. C. S. |

The details of the 5 electric locomotives follow:

| | |
|---|---|
| Date of delivery | March and April, 1925 |
| Builder of body | Pacific Electric Railway |
| Total weight | 127,000 lb. |
| Bolster centers, length | 17 ft. 8 in. |
| Length over all | 34 ft. 0 in. |
| Truck wheelbase | 7 ft. 4 in. |
| Width over all | 10 ft. 0 in. |
| Height, rail to trolley base | 11 ft. 10½ in. |
| Body | All-steel |
| Roof | Arch |
| Air brakes | Westinghouse, type EL 14 |
| Armature bearings | Friction |
| Axles | Pollak A. S. T. M. Spec. A19-21 |
| Bumpers | Local castings C.I. |
| Center and side bearings | Local castings C.I. |
| Control | General Electric type PCL |
| Couplers | National Malleable Company |
| Gears and pinions | General Electric grade M. |
| Hand brakes | Miner Ideal |
| Headlights | Crouse-Hinds |
| Journal boxes | Symington, semi-steel |
| Lightning arresters | General Electric |
| Motors, type and number, | 4 GE-251-A-205 hp., inside hung |
| Sanders | Local manufacture, air-operated |
| Springs | Railway Steel Spring Company |
| Trolley base | Pacific Electric pneumatic |
| Trolley wheels | Kalamazoo No. 23 |
| Trucks | Commonwealth cast steel |
| Ventilators | Globe type |
| Wheels | 38½-in. steel tired |

## *Track and Line*

**Washington Railway & Electric Company, Washington, D. C.,** during the present year will spend $400,000 on improvements in northeast Washington.

**Portland Electric Power Company, Portland, Ore.,** is spending $15,000 in installing double cross-over tracks on Union Avenue and Holladay Avenue and at Grand Avenue and East Morrisson Street.

**New Haven & Shore Line Railway, New Haven, Conn.,** has received permission to extend its line in the town of Madison to Long Island Sound through property owned by the state at Hammonassett Beach.

**British Columbia Electric Railway, Vancouver, B. C.,** has awarded the contract for a tunnel 3,561 ft. long from Alouette Lake to Stave Lake to O. Olson, Maple Valley, Wash., for $331,600.

**Binghamton Railway, Binghamton, N. Y.,** plans new trackage extensions in Binghamton to Johnson City at a cost of more than $100,000.

## *Power Houses, Shops and Buildings*

**Albany, N. Y.,** is to have a central bus terminal with a central station for seventeen interurban systems opposite the Plaza on Broadway in the business center of the city. The expense of constructing a waiting station and its maintenance are to be borne jointly by the various bus companies.

**Pacific Northwest Traction Company, Everett, Wash.,** is planning immediate improvements in Mount Vernon and Skagit County which will cost more than $250,000. The plans include the construction of a large new stage depot and garage, to cost $15,000. The depot will have a platform covering three-quarters of an acre, with an inclosed portion 30x70 ft., for the accommodation of interurban buses. Several new bridges, new rails and miscellaneous improvements are planned on the company's system in Skagit County.

**Philadelphia Rapid Transit Company, Philadelphia, Pa.,** is having plans prepared for superstructure of carhouses at Twentieth and Johnstown Streets at a cost of $300,000.

**New York, N. Y.**—The Transit Commission recently opened bids for the furnishing and erecting of structural steel for the electrical repair shop in the Coney Island yard for the Brooklyn-Manhattan Transit system. Twelve bids were received, the lowest of which was that of J. P. Clarke of the Grand Central Terminal for $66,137.50.

**Atlantic City & Shore Railroad Company, Atlantic City, N. J.,** is planning to build a substation in Atlantic City, to cost about $75,000. A similar station will be built at Hammonton.

## *Trade Notes*

**Lawrence I. Grinnell** has resigned as manager of publicity of the Metal & Thermit Corporation, New York, and as associate editor of *Reactions*, published by the company. Mr. Grinnell is now connected with the real estate firm of Douglas L. Elliman & Company, New York City.

**Cleaton Company, Montreal, Canada,** eastern Canadian representatives of the Conveyors Corporation of America, Chicago, has moved to its new office at 1070 Bleury Street, Montreal. The Cleaton organization handles the sale of American steam jet ash conveyors, American air-tight doors and other power plant specialties in Montreal and eastern Canada.

**New York-Chicago.**—The sales arrangements whereby the National Railway Appliance Company in New York and Holden & White, Inc., in Chicago, have acted as selling agents for the Drew Electric & Manufacturing Company, Cleveland, have been discontinued.

**Economy Fuse & Manufacturing Company, Chicago, Ill.,** on June 1 removed its Chicago district sales office from 536 Transportation Building to larger quarters at 513 West Jackson Boulevard.

**Paul J. Moore** retired on June 1 as chief of the fire department at Newark, N. J., to become associated with the Foamite-Childs Corporation of Utica, N. Y., as a special representative of that concern's motor fire apparatus department. Chief Moore holds the distinction of having filled, by permanent appointment, every grade in the fire-fighting service. He will now be actively engaged in the educational work that the staff of the Foamite-Childs Corporation fire protection engineers are doing with the Foamite pumper as their latest development for modern fire fighting.

## *New Advertising Literature*

**Walter A. Zelnicker Supply Company, St. Louis, Mo.,** has issued bulletin No. 320, giving capacities and sizes of new oil storage tanks and tanks for use with air equipment.

**Harris, Forbes & Company, New York, N. Y.,** have issued a booklet on public utilities. It traces the development of the public utility business in this country during the last forty years to its present position as the third largest industry in the United States from the point of view of invested capital.

**Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.,** has issued a comprehensive publication entitled "The Performance of Instrument Transformers." The new thirty-two-page book, which is known as Special Publication No. 1696, analyzes the factors underlying the performance of both current and voltage transformers and gives complete information for the successful application of these transformers to an electrical system.

New York, June 14, 1924

# Electric Railway Journal

*Consolidation of Street Railway Journal and Electric Railway Review*

Published by McGraw-Hill Company, Inc.

Henry W. Blake and Harry L. Brown, *Editors*

*Volume 63*
*Number 24*

## Transit Facilities Must Increase Faster than the Population They Serve

A POINT made frequently by the telephone companies to explain the high rates in large cities is that when the number of subscribers is increased the plant required to handle the business goes up much faster than in direct proportion. This is easy to prove, as each subscriber must be given a means of connection with every other subscriber.

In a way, the same reasoning applies to street railway and rapid transit lines. Where the population is small, and is located quite close to the business center, the rides are short and the number of lines required is low. As the city grows, the near-by areas are all taken up and the additional residents must live at a greater distance from the center. They spread over a greater area so that not only are they hauled a greater distance, but more lines must be provided proportionally to serve them adequately.

While the greater haul imposes a greater burden of time on the riders, it imposes a greater burden of cost on the railway. It is only by loading the cars more heavily and using all possible economies that the added burden can be carried without an increase in fares over what obtained in the past with shorter hauls and lower unit costs.

That the street railways have been able to do as well as they have in the past few years with post-war inflation, and in many cases vicious competition, is a tribute to the ability of their managements. But the demand for foresight and ability are almost insatiable, as the acuteness of the problems increases still more rapidly than the rapid growth of population. For this reason every street railway man needs to be alive to the idea of modernizing, and not be content even though he feels that he has done a good job with today's problem, as he will be presented with a harder one on the morrow—harder unless he looks ahead and plans his future facilities as do the telephone companies, which are constantly planning 20 years ahead.

## Keeping the Purchasing Department "Next Door" to the Engineer

"WE ALWAYS have trouble to get just what we want through the purchasing department," said the engineer of a large railway the other day. "The purchasing agent is an inside man and the difference of a fraction of a cent in the prices of two articles almost always governs his selection. So we often have to take something nearly the same as what we ask for and a little cheaper."

"We never have any trouble of that kind," said the engineer of another company. "The purchasing department is located next door to my office. When I want something special I go in and talk to them about it and I usually get it the way I want it."

Is there not in this actual conversation something that is worth careful consideration? The engineer is the man who is fitted by education, training and experience to make the selection of the material of which the structure is to be built, be it a car, a building or a piece of track. He is the one upon whom rests the responsibility for the performance of the finished work. He should not, and ordinarily he does not, concern himself with the maker of the material. The purchasing agent is the man to consider manufacturers and prices. But the engineer has a real interest in the quality of the material to be used, and after he has drawn up his specifications the difference of a few cents in the cost should not prevail against his judgment as to the particular design. The most satisfactory results are likely to be attained when the engineer is given adequate authority in the selection of his material and the purchasing department co-operates with him to secure what he wants on the best possible terms.

## Property Owners Want Assurance of Permanence and Responsibility

WHEN it comes to a question of establishing a permanent transportation system property owners seem to have greater faith in a railway than in a bus line. They like the bus and ride in it when it suits their convenience to do so. But in cases where transportation is a vital necessity, as between the home and the place of business, there is something substantial and confidence inspiring in the sight of rails in the street. They feel that once the rails have been laid the route is established and transportation is there to stay.

This feeling was well illustrated a short time ago when the property owners in the Morningside district of Atlanta, Ga., decided to construct a railway of their own to connect with the lines of the Georgia Railway & Power Company. Because it was apparent that in the beginning such a line would not be a paying proposition, the railway felt that it could not at present undertake to build or operate it. The suggestion was made that a bus line would adequately take care of the transportation needs of this district for several years to come. But the property owners declared that they would have no feeling of security with a bus line as their only means of transportation. They wanted something permanent, something they knew they could depend upon day in and day out. Since the existing railway was not in a position to construct such an extension, the property owners decided that the best way to accomplish the desired end was to build a railway of their own.

Probably these property owners missed the real point. Fundamentally it is not so much a question of whether the service is given by railway or by bus as it is a question of whether or not the service is given by a responsible transportation agency. The free-for-all method of bus operation that has been permitted in many places has marred the reputation of the bus for reliability. In this case, if investigation indicated that a bus line would be adequate to handle the traffic, that would probably have been a more economical solution of the problem. But in any case the incident clearly shows that people want transportation service to be furnished by a reliable and responsible agency, such as the railway company.

## Two Thousand Miles Apart in Spirit

YOU can hold a nickel so close to your eye that it hides everything else.

Not so long ago a dispute arose in a certain city between a passenger and a conductor. The passenger claimed that he had paid his fare when he boarded the car and that that should entitle him to ride all the way to his destination. The conductor pointed out that the car was then in the second fare zone and that the passenger had paid fare only in the first zone. Words flew back and forth for some time with neither disputant making any progress toward convincing the other. Then the conductor had the car stopped and called the motorman to the rear. The argument gained headway with two against one. The other passengers waited impatiently for the car to continue its trip. Finally a man walked to the rear of the car, remarking that he could not "wait all day for a nickel" and dropped 5 cents in the farebox for the other fellow. Then the car went on.

In another city 2,000 miles away a difference arose between the conductor and a woman passenger over the use of an incorrectly punched transfer. The conductor politely pointed out why the transfer as punched was not valid. On her side the woman contended that the transfer had been given her a few minutes previously on another car and that she should not be the one to suffer because the conductor had punched it wrongly. Acting on the instructions of the management governing cases of this kind, the conductor then accepted the transfer. He explained that the company takes the position that the passenger is always right and that if the woman said the transfer had been given her in that way, he would not question her word but would accept it as fare.

As a matter of fact the railway does not really believe that the passenger is always right, but it has found that it is good policy to take the word of the passenger. In the first case the passenger was obviously wrong, but why penalize all the other passengers and lose their good will because of one nickel and a "dumbbell." In the other town some dishonest people succeed in robbing the railway of a few nickels, no doubt, but only an inconsequential number of riders would be unashamed to rob a company which accepts their word at face value.

Such is the story of the two railways 2,000 miles apart in spirit as well as distance. One wonders if there is any significance in the fact that the first company is having a great deal of trouble to earn its operating expenses and is involved in serious financial difficulties, while the second is happy and prosperous.

## Merchants Support No-Parking Rule When They Understand the Facts

IT WILL often be found that the retail merchants are the principal objectors to the passage of a no-parking ordinance for the downtown streets of a city. The average shopkeeper has been taught from his early days that the person who drove to a store usually had more money to spend than the person who walked to it. Hence, carriages standing in front of his entrance were to the old-time retail merchant an indication not only of profit from wealthy shoppers, but that his establishment was being patronized by the élite in his community.

It takes a long time to eradicate a long-held impression like this. Shopkeepers have been loath to have restrictions placed on those who drive to their stores, as compared with those who walk, oblivious of the fact that the conditions in regard to retail shopping described have changed very greatly. Actually now, of course, automobiles parked in front of a store in a city where indefinite parking is permitted do not mean that their owners are within. It simply means that many of those automobile owners have stored their cars there while they went elsewhere. As a consequence the majority of shoppers have great difficulty in finding a parking place and are forced to walk to the stores from considerable distances. Thus the primary effect of congested streets on the shopper is to discourage him (or her) from going downtown. This means that the small neighborhood store and the mail order houses are getting a larger proportion of the total business than has been the case in times past. If the retail merchants in a city really understood these facts, it is believed they would be in the first ranks of those who want the streets kept clear so that the shoppers who come to the shopping district by trolley, which is the vast majority of them, can do so quickly and easily.

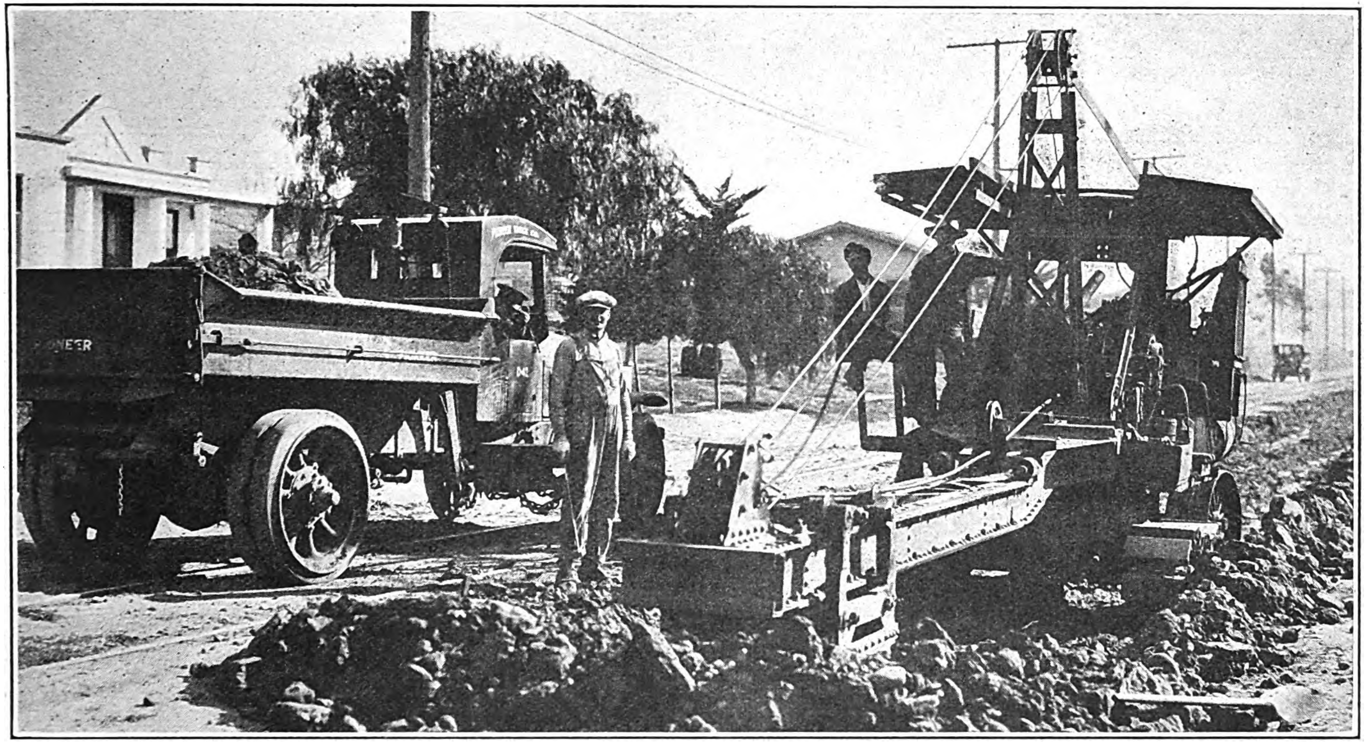
The experience of one electric railway man is enlightening. He had great difficulty in persuading a conservative retail merchant in his city that the long row of parked cars each day in front of his store did not belong to patrons of the store. The merchant became convinced of the truth only when he was shown that one of these cars belonged to a rival merchant who used that space because he did not want to block up his own entrance. The effect of this revelation was immediately to make the merchant a strong advocate of parking restrictions.

The columns of this paper have contained a number of references recently to parking restrictions. One of the most extensive of these went into effect in Detroit April 15 of this year. One reason may have been that the railways were owned by the city, so that the city authorities could better appreciate what parking meant to the surface railway system. Another reason may have been that Detroit is the home of automobiles and has a very large number of them in proportion to the population. At any rate, the stringent parking regulation which went into effect last April was supported not only by the retail merchants but by the downtown real estate owners' association, and it has been instrumental not only in increasing the car speed nearly 2 m.p.h., but in reducing street railway accidents about 10 per cent. If Detroit, the home of the automobile, can adopt an ordinance of this kind, there seems no sound reason why other cities should not do likewise.

# Building High-Speed Line at San Diego

### Track, Overhead, Signals and Stations Will Cost About $1,625,000—Passenger and Freight Service Will Be Provided—Construction Methods Are Described—New Cars Have Been Bought

*By W. O. Anderson*
Construction Engineer San Diego Electric Railway



A "Skimmer Skoop" Digging the Trench for the Mission Beach Extension of the San Diego Electric Railway

THE new Mission Beach line being built by the San Diego Electric Railway, San Diego, Cal., from Ocean Beach to La Jolla will have the equivalent of approximately 20 miles of single track, and including overhead construction, signals, automatic substations and passenger stations will call for the expenditure of a sum in the neighborhood of $1,625,000. It is planned to provide not only passenger service for the residents of the outlying suburbs of Ocean Beach, Mission Beach, Pacific Beach, Bird Rock and La Jolla, as well as holiday pleasure seekers, but also freight and express service for the surrounding territory. Such a line has long been needed to serve and develop the beaches and northerly suburbs of the city, as they have heretofore been forced to depend upon automobiles and trucks to supply transportation for both passengers and freight.

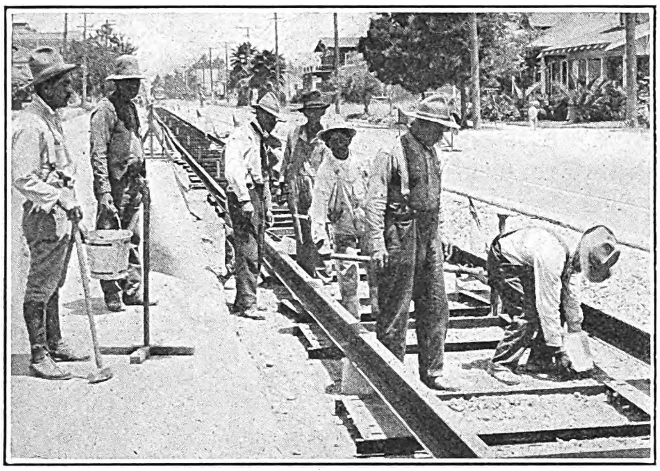
This line follows Kettner Boulevard from the Santa Fé depot at Broadway and Kettner Boulevard, in San Diego, north across the lowlands between San Diego Bay and the San Diego River to Ocean Beach, then along Mission Beach Boulevard to Pacific Beach, and from there to La Jolla. A connection will be made at Ocean Beach Junction to the old Ocean Beach line on Bacon Street, and the latter line will be reconstructed. The route is shown on the accompanying map.

In this construction the best modern practice will be followed. The absence of heavy grades, sharp curves, grade crossings, and the use of 128-lb. rail, steel ties and concrete ballast in paved streets, with 75-lb. rail, wood ties and rock ballast in open track, and the installation of a catenary overhead will make it possible to give express service second to none on the Pacific Coast.

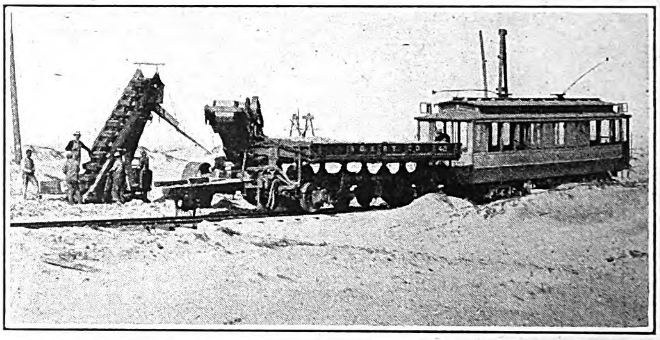
Two very dangerous grade crossings where the Santa Fé Railroad, the highway and the present electric line cross each other at Tide Street will be eliminated and a three-level crossing substituted. The highway will pass under both the Santa Fé and the electric line on a lower level. The latter will pass over both the highway and the Santa Fé, thus permitting the operation of high-speed express service without danger of accidents. Operation will be facilitated by the installation of the Nachod block signal system, which will reduce to a minimum the chance of collision.

In paved streets the rail used is 128-lb. girder rail with an M.C.B. flangeway to accommodate M.C.B. equipment for freight service. Steel ties will be used and the whole track imbedded in a concrete slab $16\frac{5}{16}$ in. thick. The open track construction will be of 75-lb. A.S.C.E. rail, wood ties and rock ballast. The San Diego Electric Railway was the first company on the Pacific Coast to use the steel twin tie. This feature, while comparatively high in initial cost, is expected to reduce the maintenance cost to a minimum. Moreover, with the present price of timber, steel ties are not much more expensive than the old-fashioned wood ties.

Pavement is broken by pneumatic breakers, and a



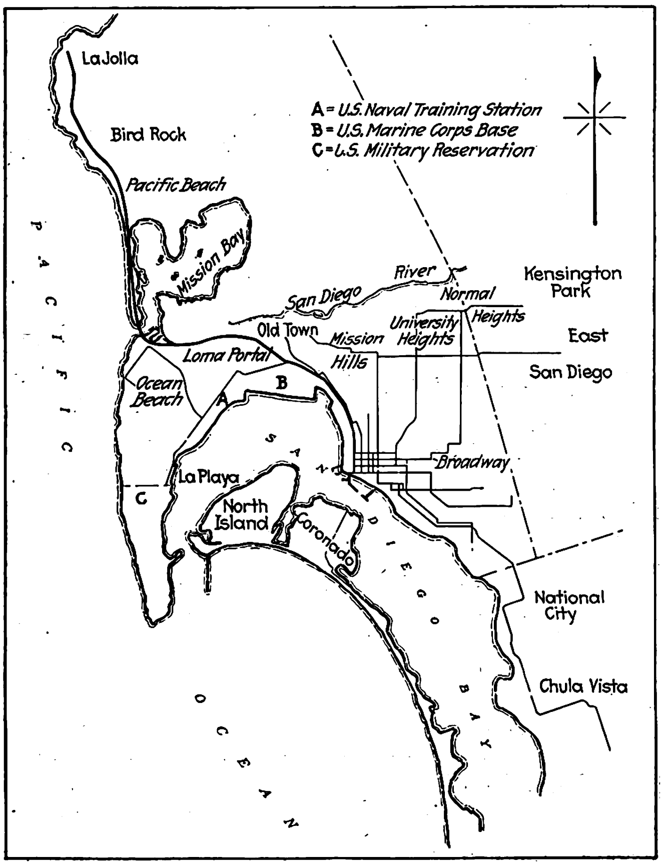
At Left, Placing One of the Concrete Pedestals Which Support the Track During Construction
At Right, Steam Shovel Loading Cars at a Borrow Pit



Among the Sand Dunes a Barber-Greene Loader Was Used to Fill the Dump Cars

"skimmer skoop," shown in an accompanying illustration, then cuts a trench to a depth of 14 in. As fast as the trenching is completed, 4-in. drain tile is laid along the outer edge of the trench on a level about 8 in. below the sub-grade and is covered with crushed rock. The drain empties into the nearest available sewer manhole or culvert.

Rail is supported above the sub-grade by concrete pedestals at intervals of 12 ft. After the track is laid, clipped and the joints bolted the latter are welded to the ball and base of the rail. The base of the rail is welded to the tie plate at each joint and midway between, 60-ft. rails being used. Bolts are spot-welded after they have been tightened up sufficiently, as are also the tie clip wedges. Track is then aligned and brought to grade by the adjustment of two cast iron wedges, placed on top of each concrete pedestal. Concrete is placed by a caterpillar-mounted, gasoline-driven mixer, which travels along the side of the trench and deposits the concrete.


LaJolla
Bird Rock
Pacific Beach
Mission Bay
PACIFIC
OCEAN
A = U.S. Naval Training Station
B = U.S. Marine Corps Base
C = U.S. Military Reservation
San Diego River
Normal
Kensington Park
University Heights
Heights
Old Town
Mission Hills
East San Diego
Loma Portal
Ocean Beach
A
B
SAN DIEGO BAY
Broadway
La Playa
C
North Island
Coronado
National City
Chula Vista

Route of the Mission Beach Extension Being Built by the San Diego Electric Railway

The nature of the territory through which this extension is being built has caused the company to resort to practices unusual for electric railways. Through the salt marshes considerable fill was necessary, and this material was obtained from borrow pits along the right of way. It was loaded by a steam shovel onto air operated dump cars, which carried it to the point on the line where it was needed. When building the line through the sand dunes, a Barber-Greene machine was made use of to load sand on to the dump cars. This operation is shown in an accompanying illustration.

On downtown streets the overhead construction will be double-pole, but in the open a single-pole catenary construction using No. 0000 phono-electric trolley wire will be employed. All special work is bonded by 500,000 circ.mil cable welded at the connections to the rail. It is believed that this bonding, cross-bonding and the welding of joints will entirely do away with electrolysis trouble. Power distribution will be facilitated by new automatic substations at Ocean Beach Junction and at Pacific Beach.

New multiple-unit cars built by the American Car Company will be operated on the Mission Beach division as soon as construction work is completed. They are equipped for operation as single units by either one man or two men. The cars are 48 ft. long and weigh 38,000 lb. Each car will have four motors. Current collection will be by means of a special pantograph arrangement as shown in an accompanying picture.

Double doors and folding steps are operated by National Pneumatic safety interlocking devices and are controlled by push buttons located on the stanchion in the center of the platform as shown in the accompanying illustration. End doors will be an innovation for double-truck cars in San Diego as heretofore all the railway's large cars have been of the center-entrance type.

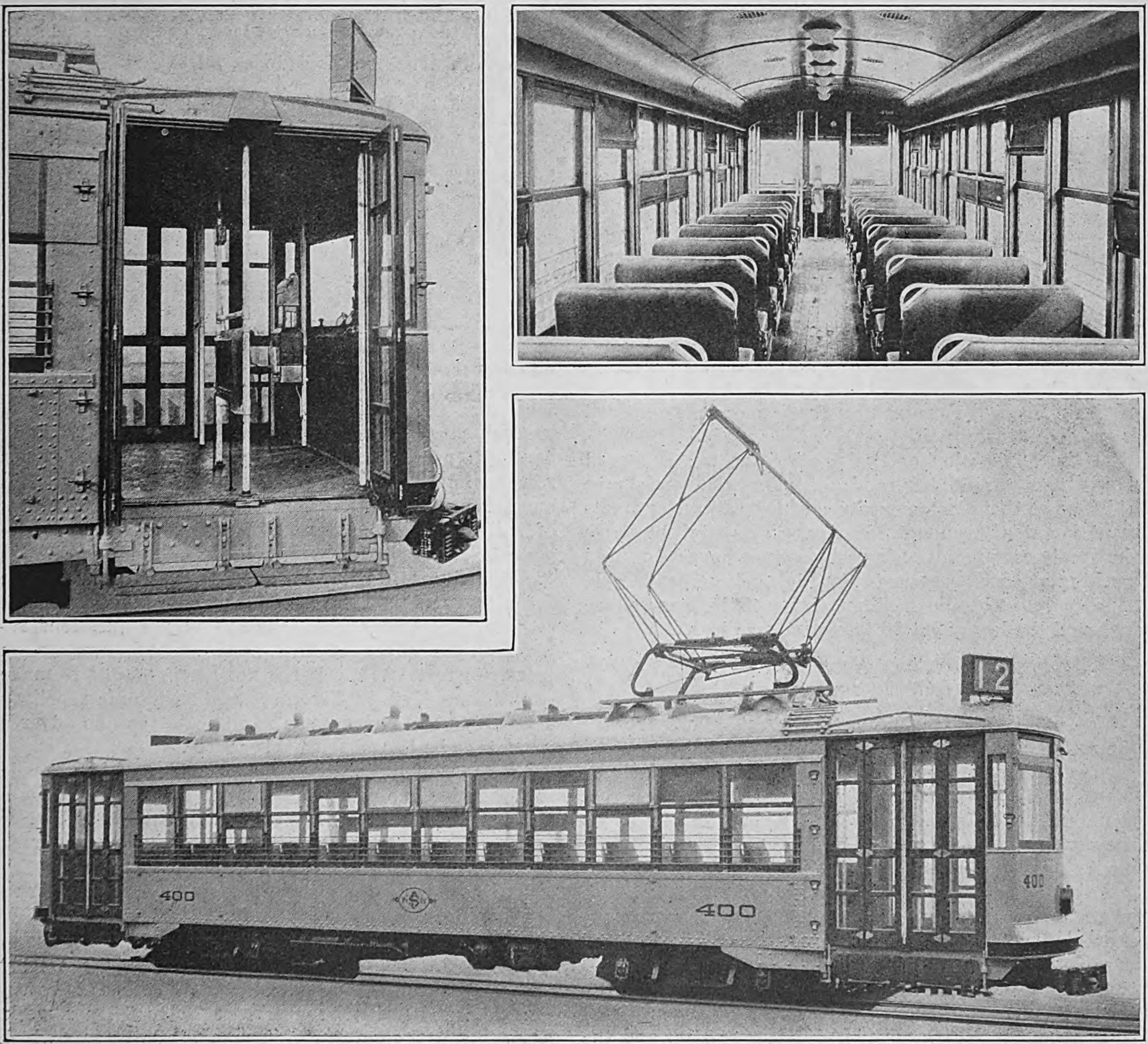
Seats for 56 passengers are provided. A folding seat has been placed between the stanchions near the doors. When one set of doors is not in use this seat can be let down to accommodate additional passengers. The interior of the car is pleasingly free from rods, cords and other devices.

Artificial ilumination is provided by a row of dome lights down the center of the car. Other cars of the same type have been bought for operation in the city of San Diego.

About midway down the neck of land forming Mission Beach an amusement resort is contemplated. This will have the usual features of recreation centers, such as bathing, boating, etc. The popularity of the beach resorts adjacent to San Diego has proved to be such as greatly to overtax the accommodations now available, and the establishment of another recreation center will serve a great number of pleasure seekers who have heretofore been deprived of their amusement because of lack of accommodations and transportation facilities.

In addition to the concessions and amusement features at Mission Beach an enormous bathhouse, larger than any other on the Pacific Coast and containing more than 1,300 rooms, is being constructed. An immense indoor plunge will be built, and bathers will thus have an opportunity of choosing between the indoor pool, the surf bathing on one of the finest beaches known or still-water bathing in Bonita Bay.

An auditorium of steel and concrete will be erected in the near future, with a capacity of about 7,000 people, for conventions, concerts and large public gatherings. A terminal station with a capacity of six six-car trains will be built at the recreation center, with the necessary platforms, turnstiles, shelters, waiting rooms, etc., to handle the large crowd properly. The waterfront on Mission Bay will be dredged and improved. The execution of these plans will probably cost something more than a million dollars.



At Left, Doors and Steps Are Controlled by Push Buttons on the Center Stanchion. At Right, Interior of New Car to Be Operated on the Mission Beach Line. Below, One of 50 New Multiple-Unit Cars for the San Diego Electric Railway

# Hardening Rail Surface in the Track

### The Toronto Transportation Commission Is Making Experiments with "In Situ" Process Developed in England for Hardening the Running Surface of Rails

THE first application of the *in situ* process for rail hardening to be made in America has been undertaken by the Toronto Transportation Commission, Toronto, Canada, under the direction of A. T. Spencer, assistant to the general manager. The treatment has been made as an experiment to determine the value of the method under North American conditions.

The process consists essentially of a heat treatment similar to that used in hardening tool steel. An oxy-acetylene blowpipe flame is applied to the portion of the rail to be treated and immediately after heating the rail is quenched by means of a jet of water. To make the process continuous the blowpipe is mounted on a small four-wheeled car which also carries the acetylene generator, the oxygen and water tanks and the necessary arrangements for controlling the intensity and position of the flame and the jet of cooling water. On account of the difficulty of controlling conditions, only one rail is treated at a time.

In the application of the process the car is moved slowly along the track, and the flame and speed are adjusted so that the temperature of the rail under treatment is raised to about 850 deg. C., or slightly above the recalescent point. Single blowpipes have been used working at three pressures, the high being about 60 lb. per square inch, the medium about 45 lb. per square inch and the low about 30 lb. per square inch.

### PENETRATION VARIES ACCORDING TO PRESSURE USED IN TREATMENT

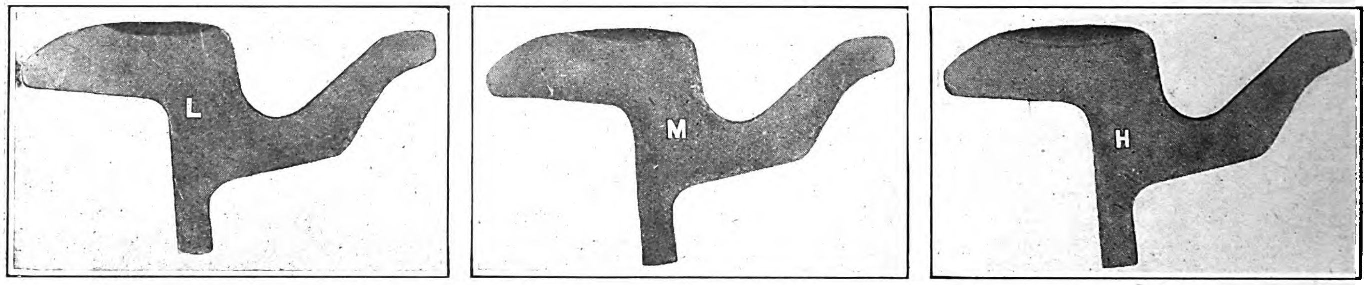
The penetration secured and the extent of area in the rail head affected by the treatment have been found to vary with the type of blowpipe used. This is indicated by the accompanying photographs of etched sections of 122-lb. girder rail that were removed from the track after treatment. The low-pressure treatment shows a maximum penetration of less than 0.2 in., and there is a sharp line of demarcation at the limits of the area affected. The medium pressure treatment shows a maximum depth of treatment of something over 0.2 in., with a much less definite line of demarcation and a somewhat wider spread of treated area on the rail surface. The high pressure treatment indicates a maximum penetration of about 0.3 in. and the area is spread over the entire wearing surface of the rail head. There is also a more gradual transition from the treated to the untreated portion of the metal. Complete hardness tests have not yet been made, but the portion treated is materially harder than the normal rail.

The process is the invention of the Messrs. Sandberg, London, England, who introduced it in England about seven years ago, primarily as a war measure, with the idea of prolonging the life of partially worn rail. It is claimed that the results obtained there are quite successful, and the process has since been used on a number of properties, not only for hardening the rail head but for hardening the guard of much-used curves and the wearing points of special trackwork.

### FIGURES CONCERNING WEAR NOT AVAILABLE

Tabulations of comparative wear on treated and untreated rail in England submitted by the patentee indicate that the wear on the treated rails is about half as great as on the untreated rails. It also is claimed that when corrugations are properly ground out and the treatment applied corrugation does not recur.

In 1922 the Toronto Transportation Commission entered into an arrangement with Scholey & Company, the licensees of the process in England, to treat certain sections of track in Toronto as an experiment. That season a total of about 1 mile of single track was treated, part of which was 90-lb. girder rail having had up to nine years' service, and part on 122-lb. girder rail having had up to one year's service. In 1923 another half mile of track was treated, various sections of rail and previous track life being chosen for purposes of comparison.



Photographs of Treated Sections of 122-Lb. Girder Rail. L, Treated with Low Pressure Flame; M, with Medium-Pressure Flame; H, with High-Pressure Flame

After the rail is treated and has carried car service for a few months it assumes a bright, highly polished surface. This condition naturally elicits questions regarding the effect of this hard, smooth surface on tractive effort. While it has not been possible to make quantitative tests in Toronto, tests on the Metropolitan Tramways of London seem to indicate that no adverse effect is to be feared from this source.

Up to the present time no attempt has been made to determine the comparative wear on the treated sections of track in Toronto as compared with the untreated sections. Measurements will probably be taken during the coming summer, but it is felt that several years must elapse before the benefits, if any, of rail treatment by this process can be determined.

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Bradford, England, having introduced the weekly pass with satisfactory results, the city of Hull is to try the plan. The charges are from 2s. to 5s. per week, according to the number of zones and routes over which the pass may be used.

# Railway Prospects Brighter in the South

### Many New Cars Are Being Operated in the Larger Cities — Repair Shops Have Been Improved — Jitney Competition Is Diminishing — Traffic Signals Are Widely Used

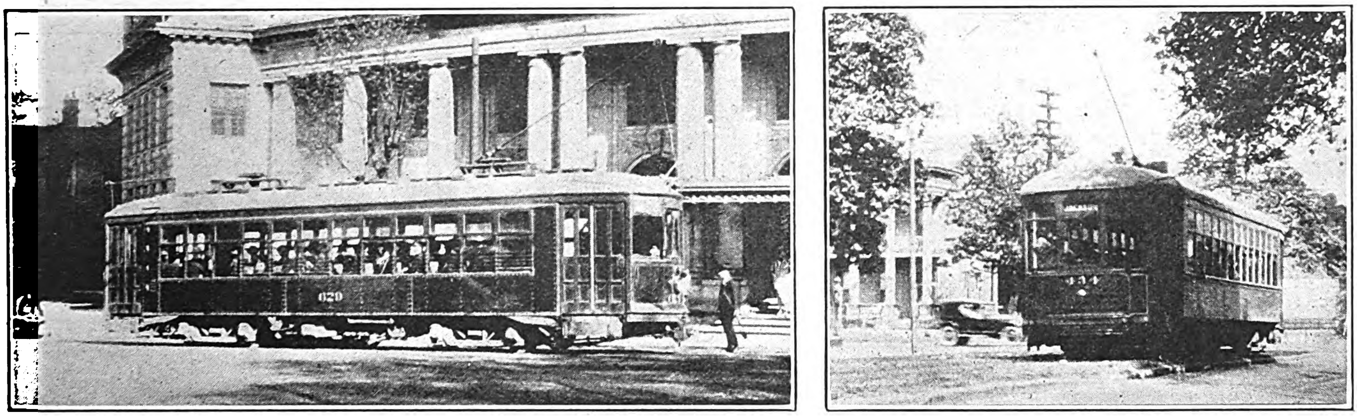
*By J. A. Miller, Jr.*
Assistant Editor ELECTRIC RAILWAY JOURNAL

ONE of the first things that impresses a visitor in the South is the large number of new electric railway cars on the streets. In the main these are light-weight, double-truck, two-men cars, although one-man operation has been undertaken in some cities, and is under consideration in others. Improvements are being made in the railway shops and a considerable amount of track is being reconstructed. The impression is created that the railways in the Southern states have got back on their feet and are moving forward.

In Atlanta, the Georgia Railway & Power Company has 40 new cars, some of which were built by the McGuire-Cummings Company, while others were built in the railway shops. They are large double-truck cars with arched roofs and have comfortable riding qualities. The New Orleans Public Service, Inc., the successor to the old New Orleans Railway & Light Company, has about 100 new cars built by Perley A. Thomas, another 100 good cars not quite so new, and about 75 more on order. These new cars, which are similar to those in Atlanta, have been helpful in reducing the cost of operation.

Birmingham, Ala., has new cars also, but they are of a different type. Both center and front doors are provided. All passengers board by the center doors. White passengers leave by the front door, while negroes leave by the center door. The large seating capacity, 62, is an interesting feature of these cars. New cars have been in service in Memphis, Tenn., since the early part of the present year. Although made by a different builder, the St. Louis Car Company, these are quite similar to the ones in Atlanta and New Orleans. It is said that 40 new cars have replaced nearly 100 old single-truck cars. On June 1, a group of new cars was placed in service in Knoxville, Tenn. The Knoxville Power & Light Company purchased seven single-truck curved-side safety cars from the Cincinnati Car Company and also seven similar double-truck cars. They are very much like the light-weight curved-side cars which have been operated for some months by the Kentucky Traction & Terminal Company, Lexington, Ky. Before being placed in service the cars were put on exhibition for three days and were inspected by more than 5,000 citizens of Knoxville.

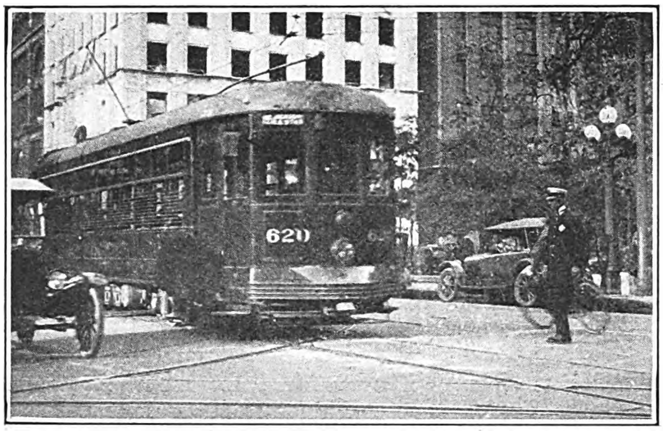
Except for the new cars at Knoxville most of the new rolling stock in the South is of the two-man type. The race question has a good deal to do with this. Throughout that part of the country it is necessary to divide the car interior into two parts—one for white people and one for colored people. There seems to be no objection to both races entering by the same door, but separate exits are demanded. Otherwise it would be necessary either for the white people to pass through the colored section of the car when getting off, or for the colored people to pass through the white section.



At Left, One of the New Cars of the Georgia Railway & Power Company on Ponce de Leon Avenue, Atlanta. The View at the Right Shows a Modern Car on the Jackson Avenue Line, New Orleans

This problem was solved in Birmingham by the center-entrance front-exit arrangement already described. In the Knoxville one-man car, the motorman will control pneumatically a rear exit door, so that any desired arrangement can be made for boarding, alighting and separation of the races. On the other hand, in Richmond, Va.; Charleston, S. C.; Tampa, Fla., and Savannah, Ga., and other places, one-man cars with front entrance and exit are used in considerable numbers, and appear to have the approval of the public.

Yellow or orange is now the color used almost universally for electric railway cars in the South. A few years ago various shades of dark green were to be seen nearly everywhere. At present the Virginia Railway & Power Company, in Richmond, is changing gradually from green to orange. In Savannah the safety cars, which are the newest cars operated, are painted orange instead of dark green, as is the older rolling stock. Birmingham has had yellow cars for some years and still holds to that color. The new cars which the Memphis Street Railway bought the early part of this



Forty New Cars of This Type Have Been Placed in Service in Memphis Since the First of the Year

year are orange instead of green. Chattanooga, Nashville and Knoxville have also changed to various shades of yellow or orange. On the other hand, Charleston, Atlanta and New Orleans still retain the green.

Other signs of progress also are noticeable. The Georgia Railway & Power Company is planning to adopt the three-wire distribution system. Three new substations, serving both railway and commercial purposes, have recently been built. A particularly good feature of these substations is their attractive architecture and the landscape gardening which has been done around them. So well executed has this been that the buildings are really ornaments to the neighborhoods in which they are located.

In its Fulton County plant this railway already has a modern repair shop, but by the installation of new and more efficient machine tools it is expected to accomplish the repair and maintenance of rolling stock more cheaply than heretofore. Butler barn, one of the largest carhouses in the South, with 42 tracks accommodating 210 cars, has been improved. The pit capacity, which was formerly only 15 per cent of that of the barn, was increased last year to 75 per cent. A Columbia hoist and a pit grinder have been installed.

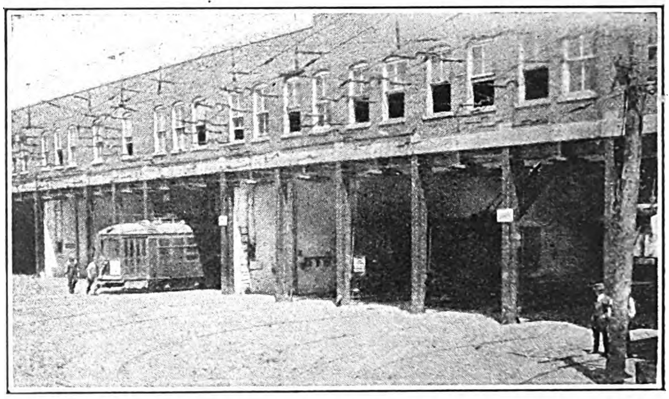
Extensive changes are being made by the railway in New Orleans. The existence of two track gages in that city has been a considerable handicap heretofore. Most of the track is built to a 5-ft. 2½-in. gage, but there are also important lines operating on the standard 4-ft. 8½-in. gage. Recommendations were made a year or more ago by John A. Beeler, consulting engineer, for rerouting and unification of the gages. These recommendations are now in process of being carried out, but the changes will be very expensive and considerable time will be needed to complete them.

One of the complications attendant upon unifying the gages will be the changeover of rolling stock. All cars recently bought have been so designed that the bodies can be mounted on the wide-gage trucks. Improvements and alterations are now being made in the shops, so that all shops and carhouses will be able to accommodate wide-gage cars. In preparation for handling the big job of changing over, new car hoists and overhead monorail systems have been installed in the carhouses.

A system of one-way streets several miles in length has been established in New Orleans. On narrow streets the movement of traffic is accelerated by having all vehicles travel in the same direction and accidents have been reduced by the simplification of traffic movement at street intersections. The double tracks of the railway on streets which are now used in one direction only have become useless and it has been necessary to provide other routes for the cars. The track department of the New Orleans Public Service is busy making these changes and others necessitated by the rerouting and unification of the gages.

At Birmingham interest centers in the reorganization of the old Birmingham Railway, Light & Power Company and the Birmingham Tidewater Railway Company into the new Birmingham Electric Company. This has permitted extensive changes in the routing of the Tidewater line and the elimination of more than 70 grade crossings. To one unfamiliar with the city the number of grade crossings in Birmingham seems incredible. Many still remain, but the rerouting of the old Tidewater line has effected an important improvement. Facilities at the railway shops are being improved by the building of a large car storage yard alongside the present carhouse.

A short time ago the people of Birmingham woke up to the fact that they could not continue to have both railway service and jitney bus operation. As the trolley was more popular than the jitney, the result was to eliminate the latter altogether. In Richmond the jitney is still in evidence but is not inflicting serious injury on the railway. On Grace and Franklin Streets 125 miscellaneous jitneys are competing with 25 buses operated by the Richmond Rapid Transit Corporation. These are one-way streets, lying between and parallel to Main and Broad Streets, where the railway operates. It is said that from 8,500 to 10,000 passengers per day are carried by the combined bus services at an 8-cent fare. Probably about 5,000 of these would otherwise ride on the street cars on Broad and Main Streets. Except for this slight loss, the Virginia Railway & Power Company is not affected by the situation, and it can therefore sit back and watch the duel. It is generally understood that the jitneys have almost ruined the Richmond Rapid Transit Corporation. More recently the city has given the bus company permission to operate also on Broad Street and this may result in some loss of revenue to the railway.



Butler Barn, Atlanta, One of the Largest in the South, Has Been Improved to Facilitate Inspection Work

The railway franchises on Main and Broad Streets will expire in the near future, and it is uncertain on what basis they will be renewed. The City Council contends that the State Corporation Commission has no jurisdiction within the corporate limits of the city. Inasmuch as the railway lines outside the city limits are now under the control of the state commission, the company desires to get the whole property under the same control. When this is accomplished the company will be in a position to make some needed extensions to its lines.

In Norfolk, Va., where the same company operates, the jitney situation is more serious. A promise was made by the City Council during a recent strike of street railway employees that jitney competition would be eliminated so that the company might earn a reasonable return on the investment in street railways. However, after the strike was over the City Council ignored its recorded pledge and no relief has been afforded up to the present time. The personnel of the Council will be altered at the election in June and there is prospect of favorable action being taken to improve the street railway situation.

Application is now pending before the State Corporation Commission to take over jurisdiction and determine the value of the street railway property in Richmond and to fix the fares. This matter will probably be concluded in the near future and will very much simplify the matter of the franchise for the railway in that city.

An appraisal of the whole property of the company was recently completed by Stone & Webster, Inc., and the State Corporation Commission has already fixed the values of the entire light and power system and of the street railways in Norfolk, Portsmouth, Petersburg and the 22-mile interurban line between Richmond and Petersburg. This leaves only the railway in Richmond yet to be evaluated. As soon as this is done, it is reasonable to believe that the City Council will promptly work out the remaining details of a proper franchise.

The jitney still flourishes in Atlanta, but the Georgia Railway & Power Company has presented its case so clearly and forcefully that public opinion is swinging around to a more favorable position. This has been accomplished in large measure by a skillful publicity campaign in which the company frankly laid its cards on the table. A petition has been presented to the City Council outlining the steps which the railway officials believe should be taken to relieve the situation. Not all of these need necessarily be taken at the present time, but only as many as may be required to enable the company to function properly. The reasonableness of these requests has been explained to the public, and the employees of the company have secured thousands of expressions of approval of the company's requests. It may therefore be expected that some solution of the problem will be found in the near future.

In Savannah a number of jitneys are still operating and are a source of some embarrassment to the railway. However, the number of such buses is not large, and the operation is altogether haphazard. It appears to be a factor of diminishing importance. In New Orleans, Memphis, Nashville and Knoxville the railways are free from jitney competition.

Gay Street, Knoxville, on a Saturday Afternoon, Showing One of a Number of Traffic Control Towers on that Street

STOP! HERE IT IS!
THE NEW SAFETY CAR
The Finest Street Car that has ever been built - LOOK IT OVER
BURLINGTON
FRONT ENTRANCE CAR
THIS IS IT! THE NEW SAFETY CAR

New Cars in Knoxville Were on Exhibition for Three Days Before Being Placed in Service

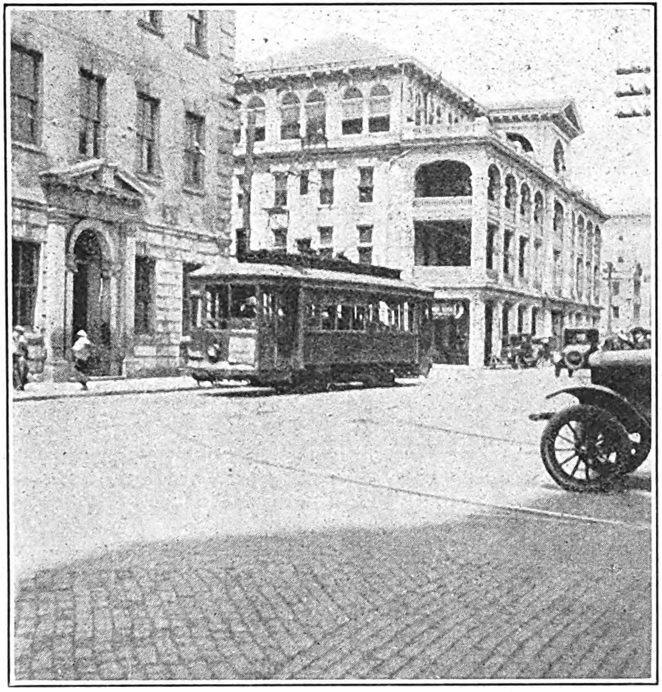
### UPHILL FIGHT IN CHARLESTON

The topographical situation of Charleston, S. C., which somewhat resembles that of Manhattan Island, complicates the electric railway problem there. Cooper River on the north of the city and Ashley River on the south join in the harbor, just off the Battery. The principal business streets are King and Meeting, which run more or less parallel to the rivers. Unfortunately for the Charleston Consolidated Railway & Lighting Company, most of the city lies within comparatively easy walking distance of the business center. Only North Charleston and the new Hampton Park district are really outside of the 10-minute walk area. Railway traffic is heaviest on Saturday, which is pay day, and decreases day by day (Sunday excepted, when riding is almost zero) until the low mark of the week is reached on Friday. Although the population of the city is about 67,000 only some 30,000 are white. The colored people have money enough to ride only on Saturday, and some few on Monday also. For the rest of the week they walk. The problem therefore is to provide railway service for about 30,000 people, and to make it pay.

Moreover, there are no outlying communities near Charleston. Columbia, Augusta and Savannah are the nearest cities, and each is a center by itself entirely independent of Charleston. There are few industries in the city. During the war, activity at the U. S. Navy Yard and at a near-by government shipping terminal brought many extra people to the city. Now, however, most of these people have left and the situation is about the same as it was before the war.

The city lines of the railway are operated on a 10-minute headway all day and during the rush hours.

The cars are never crowded. Shorter headways were tried as a means of increasing traffic but failed to produce satisfactory results. Birney cars and rebuilt single-truck cars equipped with safety devices constitute the greater part of the rolling stock, with a few double-truck cars operated on a suburban line. Recent rerouting has reduced operating cost considerably, and although the total number of revenue passengers is less, the revenue per car-mile is greater. Thus, although no large increase in traffic appears likely, the railway has introduced many economies in its shops and operation and by this means expects to get back on a firm foundation in the near future.



Traffic Congestion Is Not a Problem in Charleston, Except on Saturday Afternoon

A note of optimism prevails and one sees little placards in the windows of many stores saying "Business Is Good in Savannah." After the war Savannah suffered severely from the business slump, and the effects of this were felt by the Savannah Electric & Power Company, operating the railway in that city. Economies have been introduced in the shape of lightweight cars and one-man operation. Prospects seem bright for a business revival in the city and this will help the railway.

The construction of many miles of excellent concrete roads in the vicinity of Savannah is expected to develop the suburbs and increase the population of the city. While these roads may, to some extent, result in an increased use of private automobiles, they are likely to benefit the railway by the development of outlying communities. Construction of the Coastal Highway running through Savannah is another factor which should develop the outlying territory, and will probably bring tourists to the city. All this is likely indirectly to benefit the railway.

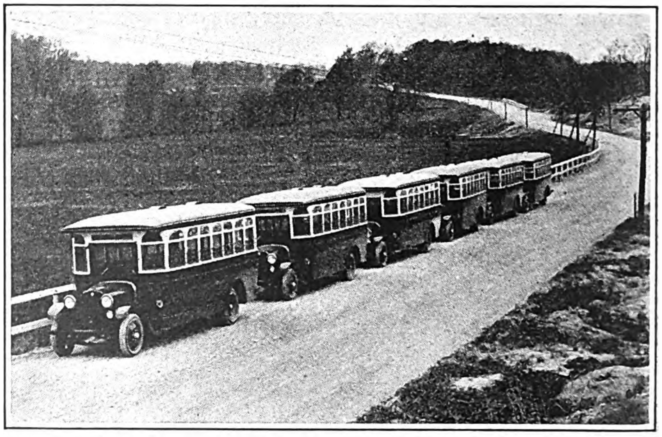
Since New York established a system of colored lights for the control of traffic on Fifth Avenue, this example seems to have been followed by hundreds of cities large and small throughout the United States. The Southern cities are not exceptions. Birmingham has the most extensive system of this kind, and operates it in the most logical way. All the street intersections in the congested district are controlled by colored signal lights operated in unison from a single point. Pedestrians are required to heed these signals, the same as vehicles do. But the signals have been installed at many street corners where vehicular traffic is light and the uninitiated are likely to cross against the direction of traffic. Local people who know the rule observe it surprisingly well, considering the fact that there is no officer of the law on hand to enforce it. The street layout in Birmingham is practically ideal for the operation of such a traffic control system, because it is perfectly rectangular. As a means of preventing accidents the signals may be desirable, but as a means of expediting traffic they do not seem to be a marked success.

Atlanta has installed traffic signals at the "Five Points" and along Marietta Street. These are individually controlled and on that account are better suited to the conditions than a system of interlocking signals would be. At some of these intersections, however, the position of the traffic officer at the curb, instead of being in the center of the street, appears to handicap his work. Similar signals are used in New Orleans along Canal Street, where a number of blocks are controlled as a unit. Although there is here, as always, some time lost because of interlocking signals, the peculiar conditions on Canal Street, with a wide neutral strip in the center where the car tracks are laid, make some such arrangement almost a necessity.

Elaborate traffic control towers have been built in Knoxville, as shown in an accompanying illustration, along Gay Street, its main thoroughfare. These are used only during certain hours of the day, and so far as a casual observer can tell, traffic moves just as well when the signals are not in operation as it does during the period they are in service. Speaking generally, it appears that no thoroughly satisfactory solution of the problem of controlling street traffic by colored lights has yet been evolved.

## Reo Buses as Feeders at Akron

FOLLOWING the decision of the city officials of Akron, Ohio, to bring back into operation the cars of the Northern Ohio Traction & Light Company, six new Reo model "W" buses were purchased, to serve as feeders to the car lines. These buses seat 21 passengers, and are equipped with four wheel brakes, dual rear wheels, 30-in. x 5-in. pneumatic tires, front and rear bumpers and automatic windshield wipers.



New Buses of the N. O. T. & L. Co.

# Speeding Up Traffic in Detroit

### A Gain of 1.85 Miles per Hour in the Downtown District Has Been Obtained, Largely Through Anti-Parking Regulations—At the Same Time Accidents Have Been Reduced—Other Means of Increasing the Speed and Otherwise Improving the Service Have Been Introduced

GOLDE CLOTHES 27.50
GOLDE 2 PANTS SUITS 27.50

Woodward Avenue Looking North from Michigan Avenue in the Rush Hour

This view was taken at 5.15 p.m. on May 26, 1924, after the anti-parking ordinance was passed. There are still a number of automobiles on the street, but transportation conditions are much better than they were.

AUTOMOBILE parking in a large section of the downtown district of Detroit is now prohibited by ordinance. This is one step in a number which have been taken in that city to improve electric railway transportation conditions.

For some time there have been limitations of day-time parking on a number of the principal streets in downtown Detroit, but the increase in the number of private machines recently has made further restrictions necessary. Recognizing this, the street railway management did much in the way of compiling and publishing data to emphasize the need for clearer streets, particularly during the rush hours. It was not alone, however, in this campaign. The retail merchants within the district affected, as well as the real estate interests, took a very active part in advocating a restriction in parking. In consequence, the City Council adopted an ordinance which went into effect on April 15, 1924, and prohibits parking between 4.30 and 6.15 p.m. within the downtown district as well as on a number of the radial avenues, as shown in the accompanying map. The only places where parking is permitted in the downtown district between the hours mentioned are three short boulevards or squares, namely, Bagley Boulevard, Washington Boulevard and Cadillac Square.

On Woodward Avenue the non-parking district extends north to the Grand Boulevard, on Clifford Street to the intersection of Cass Avenue, on Cass Avenue on the north side to West Grand Boulevard, on Grand River, Michigan, Lafayette and Fort Avenues to West Grand Boulevard and on Jefferson and Gratiot Avenues to East Grand Boulevard. During the hours mentioned, or from 4.30 to 6.15 p.m., according to the ordinance:

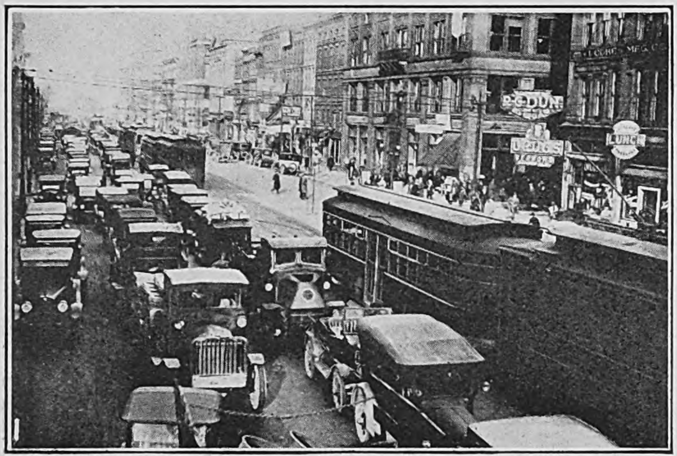
"Parking will be allowed for short periods to merchants who are forced to occupy the space in front of their stores for loading and unloading of commercial vehicles. Passenger cars may also stop at the curb to pick up passengers, but must not remain standing for a greater length of time than is required to take on passengers.

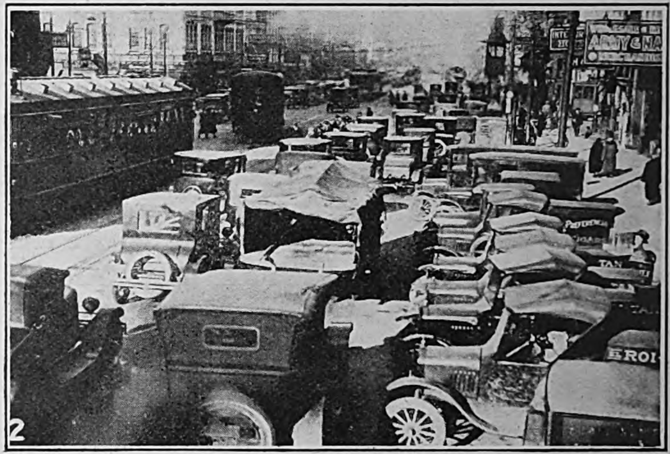
"If cars are found within this district within the hours mentioned without an attendant the police are authorized to impound them."

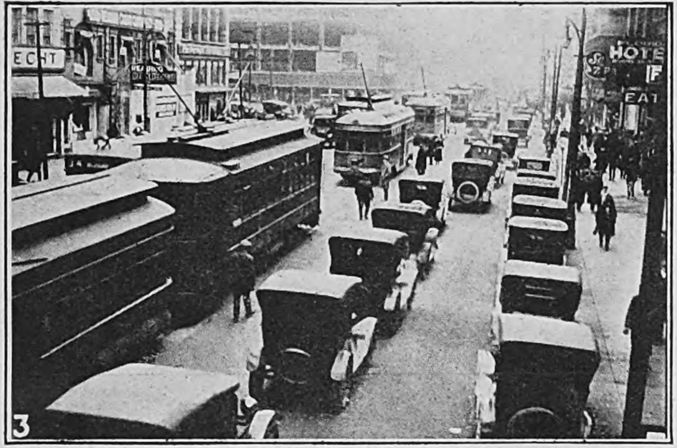
In the campaign bringing about this anti-parking regulation the Department of Street Railways distributed with effect a number of little bulletins called "Transportation Talks." Several of these are reproduced on page 929.

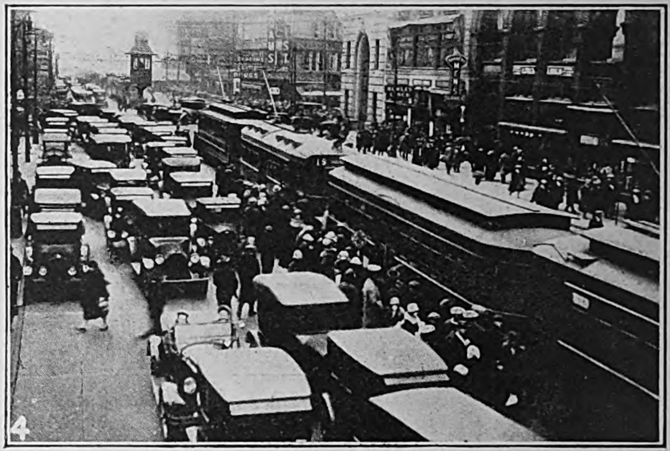
In these published data the point was made that automobile parking really is two kinds, namely, short-time parking, or the temporary stop in front of a store or office while the user transacts his necessary affairs, and the long-time parking, where the owner leaves his automobile on the street for practically the entire day while he transacts his daily business. The latter is the supply of a valuable privilege to a few at the expense of all and should be discontinued. Moreover, even if it is assumed that it is the function of the city to provide free storage in the business district for automobiles, the limits were now reached, and all drivers who enter the downtown district a little late are discriminated against.

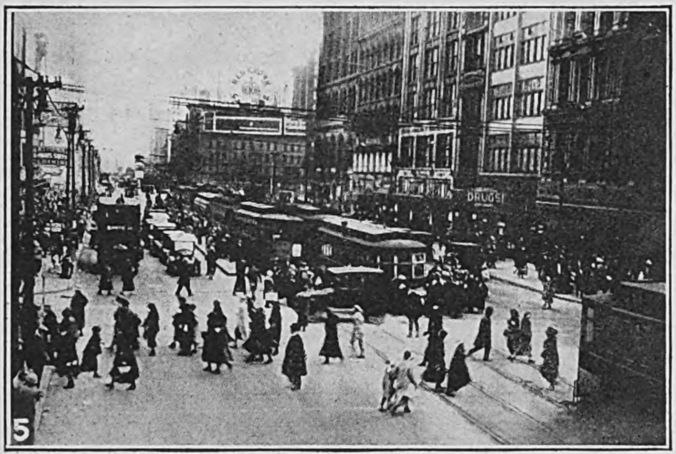
Some comparisons were also made of the street areas taken by buses and trolley cars per passenger. It was shown that the street cars in Detroit could haul an afternoon rush-hour crowd with 41.1 per cent less vehicles than if the double-deck buses used in Detroit were employed, and these street cars would require 41 per cent less linear feet of street and 21.3 per cent less area. Moreover, the interest charges and depreciation

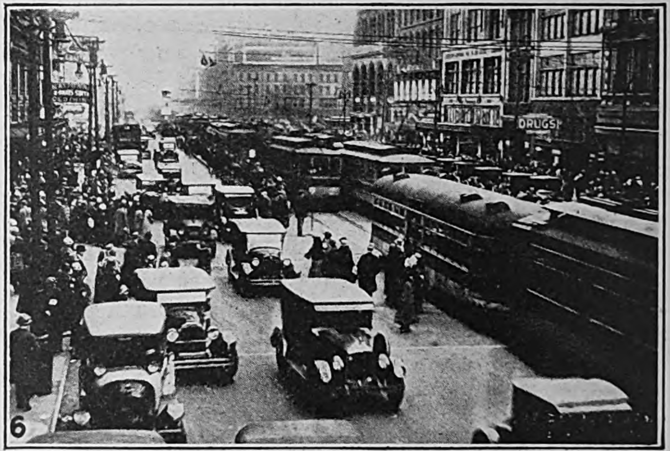


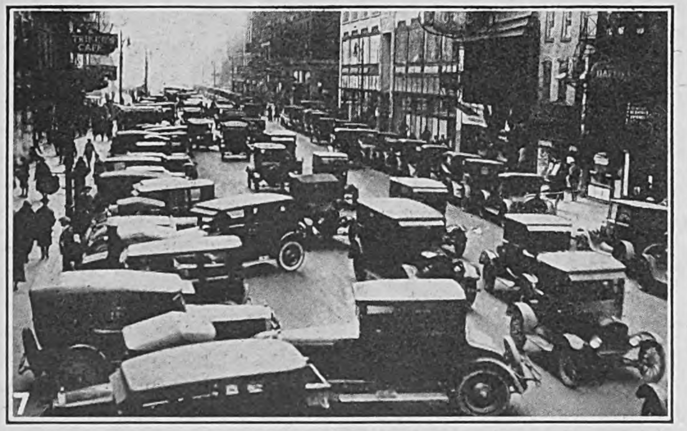


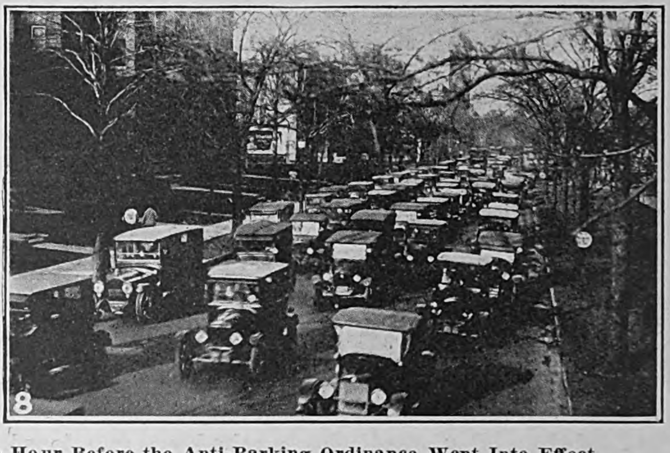












**These Views Were Typical of Detroit Streets During the Rush Hour Before the Anti-Parking Ordinance Went Into Effect**

These views show: No. 1, Jefferson Avenue looking east from Woodward; No. 2, Jefferson Avenue looking east from Griswold; No. 3, Michigan Avenue looking east from Cass; No. 4, Michigan Avenue looking west from Woodward; No. 5, Woodward Avenue at State Street looking south; No. 6, another view from the same position on a different day; No. 7, Lafayette Boulevard looking west from Griswold; No. 8, West Grand Boulevard looking east from Second Street. Photographs by the Detroit *News*.

for the cars would be 26 per cent less than for the buses. The statement was also made that experience had shown the police practically could not enforce time limits on parking. Total abolition was the practicable way.

A series of pictures showing conditions on various Detroit streets prior to the passage of the ordinance and published through the courtesy of the Detroit *News* are presented on the opposite page.

A view is also shown of Woodward Avenue, looking north from Michigan Avenue, during the rush hour after the passage of the ordinance. This view was taken on May 26, 1924, at 5.15 p.m. Although some autos are seen, their number is much less than before the passage of the ordinance against parking.

In some of the downtown views on page 928, street loading platforms may be seen, as well as queues of passengers waiting to board cars. Waiting passengers in Detroit follow this plan quite generally and the result is shorter time at stops. They do so not only for the cars but also for jitneys. Jitneys are still permitted to some extent in Detroit, and during the evening rush hours they are sent out by dispatchers from definite leaving points in the downtown side streets and run over definite routes. For the most part they are touring cars holding five or seven passengers each. The fare charged is 10 cents.

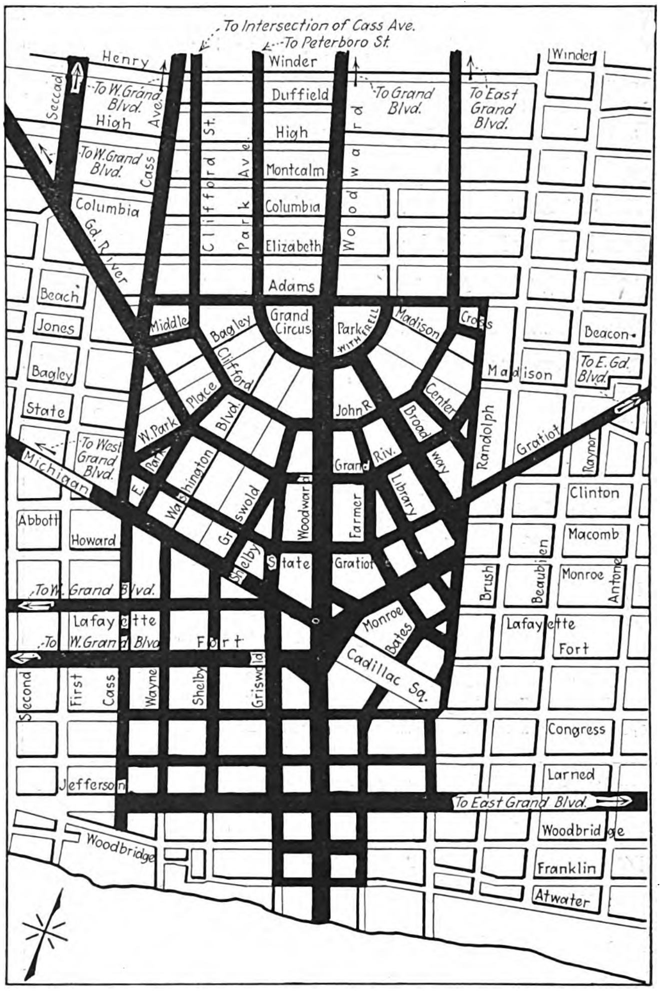
STREET RAILWAY ACCIDENTS IN DETROIT

| | March, 1924 | March, 1923 |
|---|---|---|
| Total accidents | 1,766 | 2,146 |
| Accidents with automobiles | 1,308 | 1,449 |
| Total accidents per 100,000 car-miles | 40.3 | 48.3 |

As a result of the anti-parking ordinance mentioned and other improvements described later in this article the scheduled speed of the cars in the downtown districts of Detroit has been increased 1.85 m.p.h.

Another ordinance which has helped the traffic situation in Detroit has been the establishment by the Council of a number of streets as "through streets." At such streets every automobile has to stop before entering or crossing. There are seven such streets now, and the tendency is to increase their number. These two ordinances have not only speeded up travel but have helped to reduce the accidents, particularly the automobile accidents.

The above table of accidents during March relates of course to a period before the anti-parking law went into force, but the table shows the beneficial results of the other steps taken to reduce street car accidents in Detroit.


To Intersection of Cass Ave.
To Peterboro St.
Henry
Winder
Duffield
To Grand Blvd.
To East Grand Blvd.
Second
To W. Grand Blvd.
High
Cass Ave
Clifford St.
Park Ave
Woodward
To W. Grand Blvd.
Montcalm
Columbia
Elizabeth
Adams
Grand River
Beach
Jones
Bagley
State
Middle
Bagley
Grand Circus
Park
Witherell
Madison
Cross
Beacon
Madison
To E. Gd. Blvd.
Clifford
Place
W. Park
Blvd.
John R.
Broadway
Center
Randolph
Gratiot
Raynor
To West Grand Blvd.
Michigan
E. Park
Washington
Griswold
Grand Riv.
Library
Farmer
Clinton
Abbott
Howard
Shelby
State
Gratiot
Brush
Beaubien
Macomb
Monroe
Antoine
To W. Grand Blvd.
Lafayette
Monroe
Bates
Lafayette
To W. Grand Blvd.
Fort
Fort
Cadillac Sq.
Second
First
Cass
Wayne
Shelby
Griswold
Congress
Jefferson
Larned
To East Grand Blvd.
Woodbridge
Woodbridge
Franklin
Atwater

Map Showing by Black Lines the Portions of Downtown Detroit to Which the Anti-Parking Ordinance Applies

According to the police department reports, there has been an increase each month in the street accidents in which trolley cars are not involved.

A series of moving pictures has been made of traffic conditions and will be shown before real estate associations, clubs, etc.

Issued by
Department of Street Railways

## Transportation Talks
Number 1

The best solution of the transit situation is a combination of all transportation lines in the most efficient way, tunnels, elevated, surface cars and busses.

Of the 2,500,000,000 passengers carried on all lines last year, 1,000,000,000, or 40 percent, were carried in surface cars.

In view of that it would be ridiculous to say that the surface cars must go, to be replaced by busses.

Chairman GEORGE McANENY,
New York Transit Commission.

In 1922 Chicago surface cars carried 75 percent of the traffic; in 1920 London surface cars carried more people than either tubes or busses, almost as many as both combined.

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Issued by
Department of Street Railways

## Transportation Talks
Number 2

A recent survey in the Chicago business district shows extremes to which street conditions grow.

Seventy-five percent of traffic was carried by surface cars which in turn were only ten percent of vehicles in street.

The passenger autos were fifty-one percent of vehicles but carried only nineteen percent of traffic.

Such conditions do not point to a solution of congestion by autos but demonstrate the fact that the mass of traffic in cities must be moved by large cars or trains on rails on some type of unobstructed tracks.

HENRY M. BRINKERHOFF,
Transportation Engineer.

How shall we use precious street space to the best advantage of the greatest number?

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Issued By
Department of Street Railways

## Transportation Talks
Number 6

When a street car is repeatedly held up by traffic congestion each of the persons on that car has lost valuable minutes of his own time and the cost of the service is increased, for the lost minutes increase the operating costs. All this might be saved if the car riders insisted, as they have the right to do, that as they constitute the large majority of the citizens using the highways they should have the right to use them without being blocked to such a degree.

It has been discovered by study that there are five times as many automobiles in large cities as street cars but they carry only one-fifth as many people Is it fair that 20 per cent of the people riding in five times as many vehicles should seriously interfere with the transportation of 80 percent of the people

EDWARD DANA,
General Manager Boston
Railway System

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Issued By
Department of Street Railways

## Transportation Talks
Number 7

Merchants have thought that cars parked around their stores meant increased trade. This was true once, but the limit was soon reached.

Now only part of those who would shop can find places to park near the store, and the general congestion resulting, added to the other street traffic, tends to close off the easy access to the shops for the multitudes who ride the street cars.

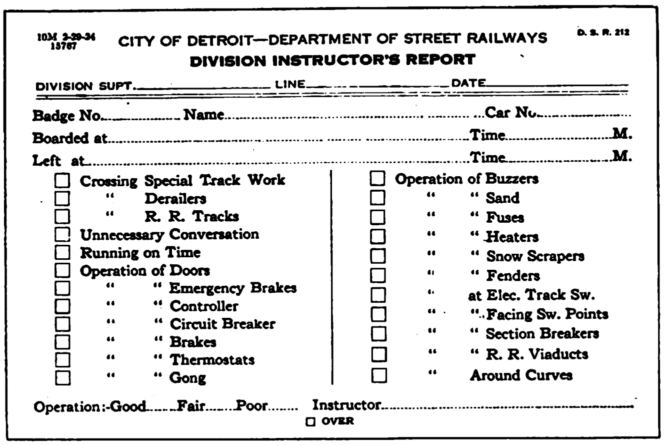
Thus, whatever makes it easier and quicker for the street car rider to get to the downtown store is of material interest to the merchant.

Typical "Transportation Talks" Issued by the Department of Street Railways in the Interest of Clearer Streets

While in general the near side stop is used in Detroit; a few far side stops have been installed, for the sake of safety and speed, where there is a branch line turnoff. In all such cases the stop point is indicated by a sign, which is usually put two pole lengths down the street to provide for double berthing.

### INSPECTORS REPORT ON HOW TIME CAN BE SAVED

Another method adopted for reducing the delays in service has been the appointment of a special corps of inspectors to study and report on this matter. These inspectors spend their entire time riding on cars to see if there is any way in which unnecessary delays can be cut out. They are instructed to look out particularly for bad street conditions, length of layovers, etc., and if it is found that a run can be cut, say from 3 to 5 minutes, a new schedule is prepared.



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CITY OF DETROIT—DEPARTMENT OF STREET RAILWAYS

D. S. R. 212

DIVISION INSTRUCTOR'S REPORT

DIVISION SUPT.________ LINE________ DATE________

Badge No.______ Name__________ Car No.______

Boarded at__________ Time______M.

Left at__________ Time______M.

☐ Crossing Special Track Work
☐ " Derailers
☐ " R. R. Tracks
☐ Unnecessary Conversation
☐ Running on Time
☐ Operation of Doors
☐ " " Emergency Brakes
☐ " " Controller
☐ " " Circuit Breaker
☐ " " Brakes
☐ " " Thermostats
☐ " " Gong

☐ Operation of Buzzers
☐ " " Sand
☐ " " Fuses
☐ " " Heaters
☐ " " Snow Scrapers
☐ " " Fenders
☐ " at Elec. Track Sw.
☐ " " Facing Sw. Points
☐ " " Section Breakers
☐ " " R. R. Viaducts
☐ " Around Curves

Operation:-Good____ Fair____ Poor____ Instructor__________

☐ OVER

Blank Used by Division Instructor to Report Points on Which New Motormen Require Further Instructions

The daily reports of these inspectors show the lines they ride, the service delays noticed and the time, duration and cause of these delays. The reports also mention all delays observed at steam railroad crossings and the number of the steam locomotive causing the delay. This permits the street railway management to take the matter up intelligently with the steam railroad officials. The inspectors are also supposed to report on any defects they notice in the track or overhead construction.

### TRAVELING INSTRUCTORS

In addition to these traveling inspectors the Detroit system has recently put on a corps of traveling instructors, whose service has been very beneficial and has helped considerably to speed up traffic.

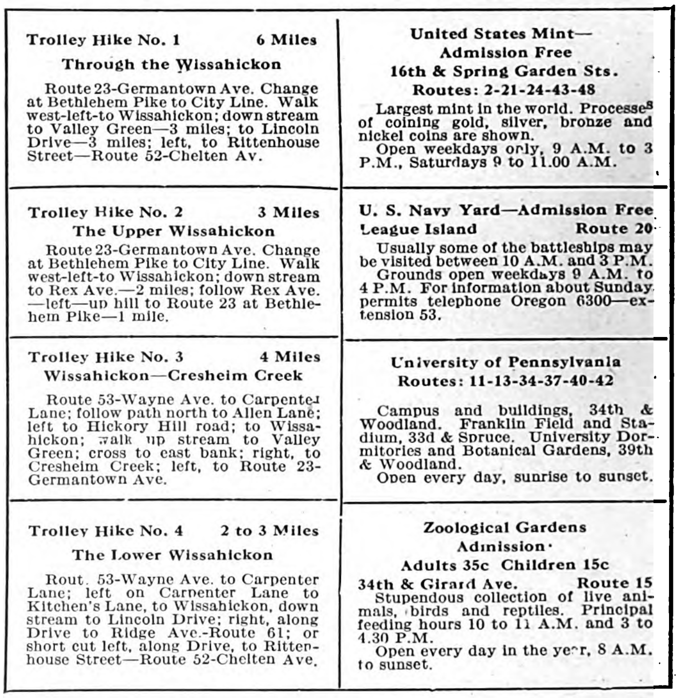
The primary duty of these instructors is to follow up the new platform men after they have been accepted into the service and until they receive a first-class rating.

These instructors use two report forms. The first tells what cars they have ridden during the day, with the boarding and leaving time for each car and name and badge number of motorman, and a brief report on the character of the operation of the car. The second blank is a more detailed report of the operation of each new motorman, but so arranged that the important points in connection with each motorman on which a report is made can be indicated by a check mark. This latter blank is reproduced. There is space on the back for further comments.

These instructors are also used for pushing campaigns among the platform men, as on economy or safety.

## Trolley 'Roun' and Know Your Town

AN ATTRACTIVE series of bulkhead and ceiling rack signs, of which four are reproduced herewith, is being used by the Philadelphia Rapid Transit Company to encourage non-necessity riding. Various points of interest around the city are pleasingly portrayed and instructions given as to how they can be reached. This is easily done as the P. R. T. designates all its lines by route numbers. The same idea telling the public where to go for amusement or edification is carried out by the use of advertisements printed on the backs of tickets. A list of "trolley hikes" is another feature of this publicity campaign.



**Trolley Hike No. 1 6 Miles**
**Through the Wissahickon**
Route 23-Germantown Ave. Change at Bethlehem Pike to City Line. Walk west-left-to Wissahickon; down stream to Valley Green—3 miles; to Lincoln Drive—3 miles; left, to Rittenhouse Street—Route 52-Chelten Av.

**Trolley Hike No. 2 3 Miles**
**The Upper Wissahickon**
Route 23-Germantown Ave. Change at Bethlehem Pike to City Line. Walk west-left-to Wissahickon; down stream to Rex Ave.—2 miles; follow Rex Ave.—left—up hill to Route 23 at Bethlehem Pike—1 mile.

**Trolley Hike No. 3 4 Miles**
**Wissahickon—Cresheim Creek**
Route 53-Wayne Ave. to Carpenter Lane; follow path north to Allen Lane; left to Hickory Hill road; to Wissahickon; walk up stream to Valley Green; cross to east bank; right, to Cresheim Creek; left, to Route 23-Germantown Ave.

**Trolley Hike No. 4 2 to 3 Miles**
**The Lower Wissahickon**
Rout. 53-Wayne Ave. to Carpenter Lane; left on Carpenter Lane to Kitchen's Lane, to Wissahickon, down stream to Lincoln Drive; right, along Drive to Ridge Ave.-Route 61; or short cut left, along Drive, to Rittenhouse Street—Route 52-Chelten Ave.

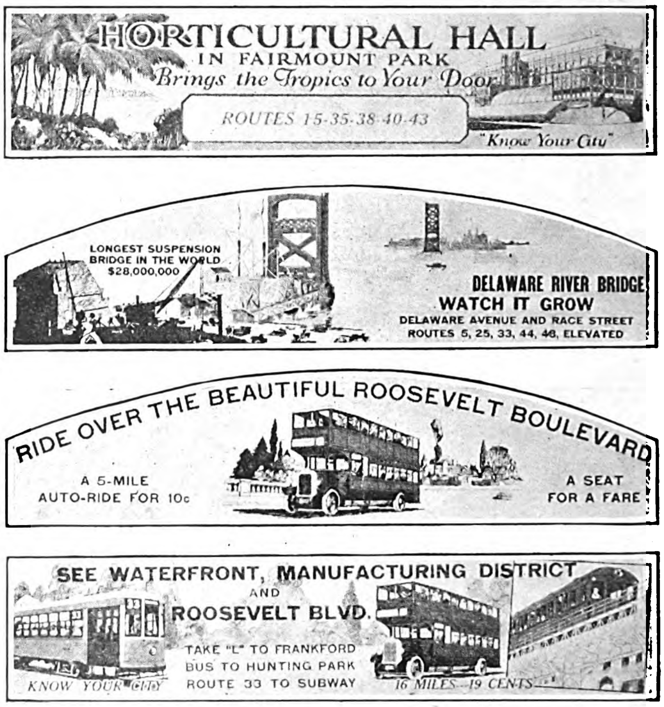
**United States Mint—**
**Admission Free**
**16th & Spring Garden Sts.**
**Routes: 2-21-24-43-48**
Largest mint in the world. Processes of coining gold, silver, bronze and nickel coins are shown.
Open weekdays only, 9 A.M. to 3 P.M., Saturdays 9 to 11.00 A.M.

**U. S. Navy Yard—Admission Free**
**League Island Route 20**
Usually some of the battleships may be visited between 10 A.M. and 3 P.M.
Grounds open weekdays 9 A.M. to 4 P.M. For information about Sunday permits telephone Oregon 6300—extension 53.

**University of Pennsylvania**
**Routes: 11-13-34-37-40-42**
Campus and buildings, 34th & Woodland. Franklin Field and Stadium, 33d & Spruce. University Dormitories and Botanical Gardens, 39th & Woodland.
Open every day, sunrise to sunset.

**Zoological Gardens**
**Admission·**
**Adults 35c Children 15c**
**34th & Girard Ave. Route 15**
Stupendous collection of live animals, birds and reptiles. Principal feeding hours 10 to 11 A.M. and 3 to 4.30 P.M.
Open every day in the year, 8 A.M. to sunset.

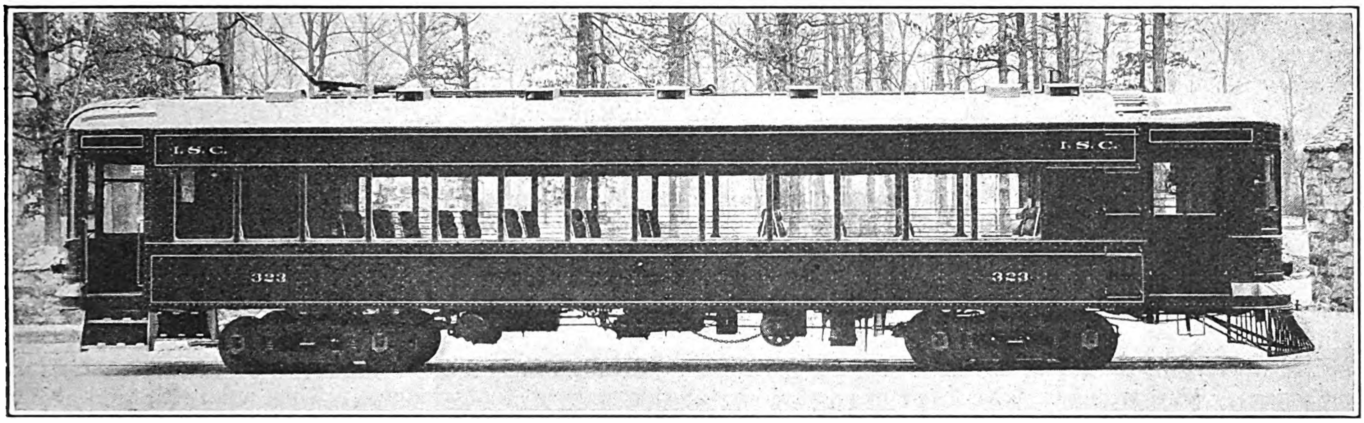
"Trolley Hikes" and Advertisements Printed on Backs of Tickets


HORTICULTURAL HALL
IN FAIRMOUNT PARK
Brings the Tropics to Your Door
ROUTES 15-35-38-40-43
"Know Your City"
LONGEST SUSPENSION BRIDGE IN THE WORLD
$28,000,000
DELAWARE RIVER BRIDGE
WATCH IT GROW
DELAWARE AVENUE AND RACE STREET
ROUTES 5, 25, 33, 44, 46, ELEVATED
RIDE OVER THE BEAUTIFUL ROOSEVELT BOULEVARD
A 5-MILE AUTO-RIDE FOR 10c
A SEAT FOR A FARE
SEE WATERFRONT, MANUFACTURING DISTRICT
AND
ROOSEVELT BLVD.
TAKE "L" TO FRANKFORD
BUS TO HUNTING PARK
ROUTE 33 TO SUBWAY
KNOW YOUR CITY
16 MILES—19 CENTS

Ceiling and Bulkhead Signs Used by P. R. T.

# Rider Comfort Features Interurban Car

**New Type of Interurban Car Developed by Indiana Service Corporation for Intercity Traffic—Riding Quality and Passenger Comfort First Consideration in Construction—Simplicity of Design of Both Interior and Exterior Produces Attractiveness—Fifty-Passenger Car Weighs 51,700 Lb.**



New Type of Car Developed by the Indiana Service Corporation for Use on Its Interurban Lines

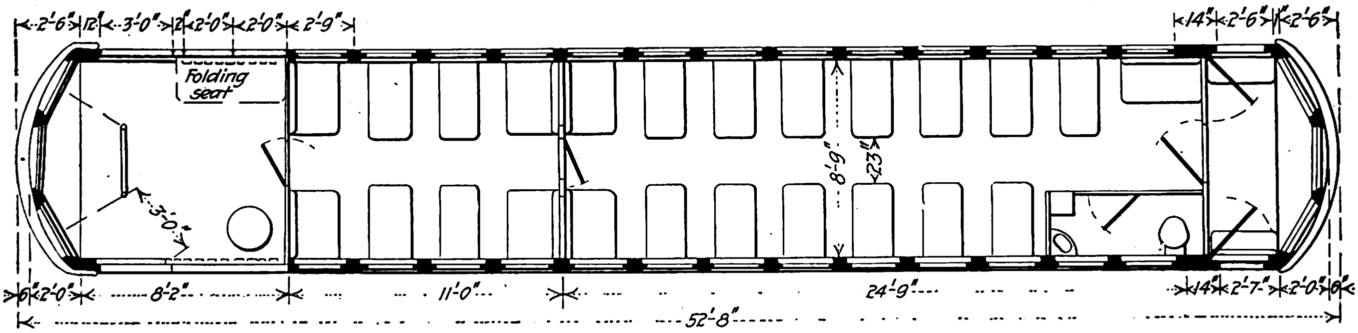
COMBINING the riding qualities and speed of the former type of rolling stock with the flexibility and economy of operation of the modern lightweight interurban cars, the Indiana Service Corporation, Fort Wayne, Ind., has developed a type of car which embodies many features new in interurban car design. Single sash windows, aluminum heating pipes, metal lined baggage compartments and mohair covered automobile type seats are some of the outstanding details of the cars which have been incorporated in the design by A. W. Redderson, superintendent of motive power.

Ten of these new cars built by the St. Louis Car Company have been placed in service, six of them on the Fort Wayne, Van Wert & Lima line, and the other four on lines of the Indiana Service Corporation. These cars are 52 ft. 8 in. long over all and have a height of 11 ft. 6¾ in. from the rail to the top of the arched roof. They seat 50 passengers and weigh 51,700 lb.

The use of 28-in. wheels brings the floor of the car 38 in. above the rail. The height from floor to headlining is only 8 ft. 1¾ in. The low appearance of the car is further accentuated by the single sash windows, the narrow side girder, and the wide letterboard. Attractiveness has been obtained by painting the car a brilliant red and striping it in gold. There is very little decorating or lettering on the exterior, the initials of the operating company at each end of the letterboard and numbers on both sides of the dash at each end of the car being the only lettering, while the striping consists of paneling on the letterboard, side girder and dash at each end.

Being single-end operated, steps have been provided at the rear only, while a sliding door on each side of the car gives entrance to the baggage compartment at the forward end. Directly back of the baggage compartment is a smoking compartment which is separated by means of a partition and swinging door from the main compartment, which is also separated from the rear vestibule by a partition and swinging door. Entrance to the car at the rear is by three steps, 13 in., 12½ in. and 12½ in. height. The rear platform may be completely inclosed by lowering trapdoors over the step wells and closing swinging doors which swing from the vestibule corner posts.

The car is of steel construction throughout. The 5-in. x 3-in. x ⅜-in. side sill angles extend from vestibule corner post to body corner post, while the car is further strengthened by two center sills of 3-in., 6.7-lb. "Z" section, which extend from front to rear bumper. Cross sills are of 3-in. x 3⁄16-in. channel-shaped steel pressings. The bolsters are cast steel. Anti-telescoping features have been included in the design of the bumper at both the front and rear ends. The 6-in., 8.2-lb. bumper channel is reinforced to resist collision with higher cars by having cast-steel anvils connect the two center vestibule posts with the longi-



Seating Arrangement of New Single-End Interurban Car, Indiana Service Corporation, Fort Wayne, Ind. Comfortable Accommodation for 48 Passengers in Car Body and Two in Baggage Compartment Is Provided tudinal center sills. The four vestibule posts are further strengthened by a 2½-in. x 1-in. x ⅜-in. dropper angle bar which extends around the end of the car at the top of the dash crown piece.

Upon this substantial underframing has been built up the car framework of steel sections. The side posts of 1½-in. x 2-in. x 3/16-in. tees are spaced 2-ft. 9-in. centers and support the roof, which is laid on carlines of 1½-in. x ¼-in. steel members set on edge. The corner posts are made up of angles and rolled steel shapes and extend from side sill to top plate. The side sheets and letterboards are riveted to the side posts with the window rest and seat rest angles and belt rails riveted to the side sheet. The side sheet is only 2 ft. 6 in. wide while the letterboard has been made 1 ft. 9 in. wide. This extra width in the latter member has resulted from the elimination of the upper window sash.

### INTERIOR APPEARANCE GOOD

The interior of the car presents a well-lighted, pleasing appearance with the white, paneled headlining, long single sash windows, narrow side posts, green plush seats and white maple floor. The interior trim is mahogany. The windows have been brought down a little farther than is usually found in interurban car practice, resulting in an individual window glass area of 30 in. wide by 34 in. high. The arm rest is comfortably low, thus allowing the passenger an extensive view of the landscape. The window glass is set in Rex brass sash. The sash is lowered against a rubber block at the window sill in order to prevent water leaking into the car. With this type of sash and a narrow side post, the obstruction to view has been minimized. A roll shade has been provided for each window. The windows on the left-hand side of the car are provided with a five-bar window guard which is fastened to the outside of the side posts and extends the full length of the car body.

**The Pleasing, Cheerful Appearance of the Interior Results from the White Paneled Headlining, Long Single Sash Windows, Narrow Side Posts and White Maple Flooring**

Extending above the windows, on the interior, is a luggage rack on each side of the car with ample room provided between it and the arched ceiling for the usual amount of hand luggage. Although advertising sign molding has been provided, no advertising cards have been placed, as the company is undecided regarding the placing of advertising in the new equipment.

Seats for fifty passengers have been provided. Forty-six passengers are accommodated on St. Louis Car Company's stationary high-back seats, two on a straight-back side seat at the rear of the main compartment and two on a folding wooden seat in the baggage compartment. The eight cross seats in the smoking compartment are covered with genuine black leather, while the fifteen cross seats and the one side seat in the main compartment are covered with green figured smooth plush. These seats are 40 in. long with full spring cushion and back construction, having a back 3 in. higher than that formerly used in cars on this property. The seat cushion is of the automobile type and has 7 in. of upholstery. The seat spacing has been made 2 ft. 9 in., which is 3 in. more than that employed in the older type of car. Each seat is provided with an adjustable foot rail which has been arranged so that it can be folded up underneath the seat, allowing the entire space for baggage storage during the trip.

One difference between this car and the cars formerly in service on the property is the absence of straight back seats at the partitions between the several compartments of the car. Seats at these locations are of the same construction as elsewhere in the car. On one side of the aisle at the rear of the main compartment is the toilet room, which occupies the space along two side windows. This enlarged toilet room contains the water cooler and bottle and the usual dry hopper toilet.

Ample illumination of the interior of the car body has been provided by means of five 150-watt lamps with Holophane glass shades. These lamps and a sixth lamp are wired to a Nichols-Lintern selector switch which cuts in an extra lamp if one of the five burns out. These lamps are spaced over the center aisle, two in the smoking compartment and four in the main compartment.

Ventilation has been provided by means of 13 Garland intake and exhaust type ventilators. These ventilators are controlled by means of registers located in the headlining of the car. As is customary in interurban practice, a hot water heating system is used. The Peter Smith heater is located in one corner of the baggage compartment while the heating coils are located adjacent to the truss planks on both sides of the car body. An unusual feature of this installation is the double circulating hot water system with four rows of 1½-in. aluminum pipe. The dual circulation pipes have been provided in order to facilitate the regulation of heat under varying weather conditions. Through the use of aluminum in place of iron pipe a saving of 600 lb. in weight has been effected and at the same time approximately 25 per cent more radiation obtained. In the motorman's cab there is one Consolidated 222 electric cab heater.

A double flooring of 11/16-in. maple laid on 11/16-in. pine, with two layers of building felt in between, has been provided. Agasote of ¼ in. thickness is used as a side lining of the car from the top of the truss plank to the arm rest, and this material is also used for the headlining of the car. The interior of the baggage room is lined with sheet steel and copper and has a 3/16-in. Firm Tread steel floor. This construction was employed in order to reduce the fire hazard should the heater stove upset in case of collision. This type of floor also reduces the work of moving baggage or milk cans about the compartment.

The car is powered by four G.E.-275, 50-hp. motors mounted on Commonwealth steel low-frame trucks with 28-in. wheels. The control of the car is by means of a K-35 controller. The motors are the field tap type. With this electrical equipment and the small diameter wheels a quicker acceleration is obtained than was possible with the old type of interurban equipment. Straight air-brake apparatus furnished by the General Electric Company has been installed.

### ENERGY CONSUMPTION SHOWS GOOD SAVING

As these cars are equipped with Economy meters, it has been possible to compare the power consumption with that of the old cars. The power consumption for one day averaged 1.95 kw.-hr. per car-mile with the new cars, while for a similar day using old equipment the consumption was 2.41 kw.-hr. per car-mile. Comparable figures on energy consumption for the old and new cars on the Fort Wayne, Van Wert & Lima Traction Company line follow:

OLD 75,000-LB. EQUIPMENT

| Date | Kw.-Hr. | Miles | Average Kw.-Hr. Car-Mile |
|---|---|---|---|
| Saturday, April 26, 1924 | 3,707 | 1,541.8 | 2.41 |
| Sunday, April 20, 1924 | 3,363 | 1,412.0 | 2.38 |
| Sunday, April 27, 1924 | 2,693 | 1,412.0 | 1.86 |
| Monday, April 28, 1924 | 3,092 | 1,557.0 | 1.95 |

The weight distribution of the new cars is as follows:

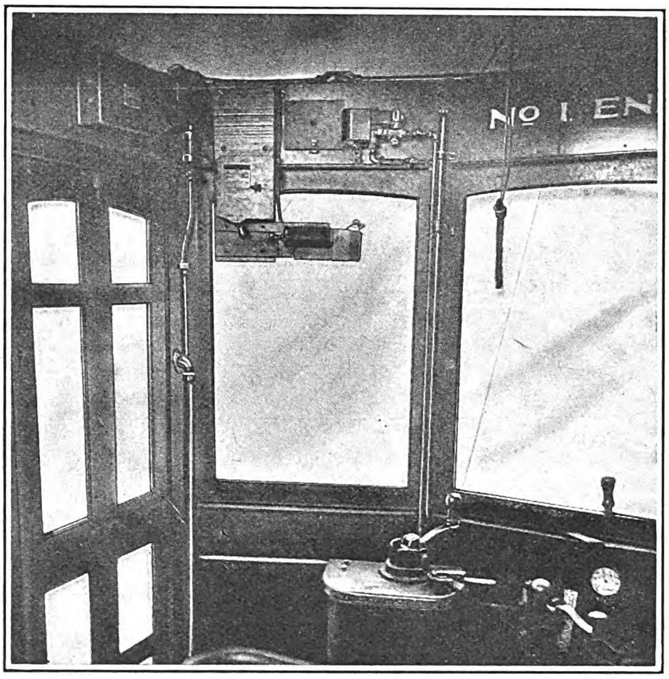
| | |
|---|---|
| Body, including control equipment, air brake equipment and hot water equipment, lb. | 28,600 |
| Trucks, cast steel, lb. | 13,460 |
| Four G. E. 275 motors (with gears and gear cases), lb. | 9,640 |
| Total, lb. | 51,700 |

# Binghamton Railway Installs New Safety Devices

### After Six Months' Trial of an Electric System of Safety Control the Company Has Decided to Install It on All of Its One-Man Cars

By FRANK HAMPSHIRE
Master Mechanic Binghamton Railway

ACTING upon the suggestion of the engineers of the Public Service Commission of the State of New York, the Binghamton Railway in July, 1923, equipped three of its one-man cars with the Simplex Safety System. These cars were then placed in regular service for a period of six months, during which careful checks were made of their operation and weekly reports submitted to the commission. No trouble was experienced with the equipment during this test and at its conclusion the commission approved the installation of the apparatus on all one-man cars of the Binghamton Railway.



Trial Installation of the Simplex Safety System on a One-Man Car of the Binghamton Railway

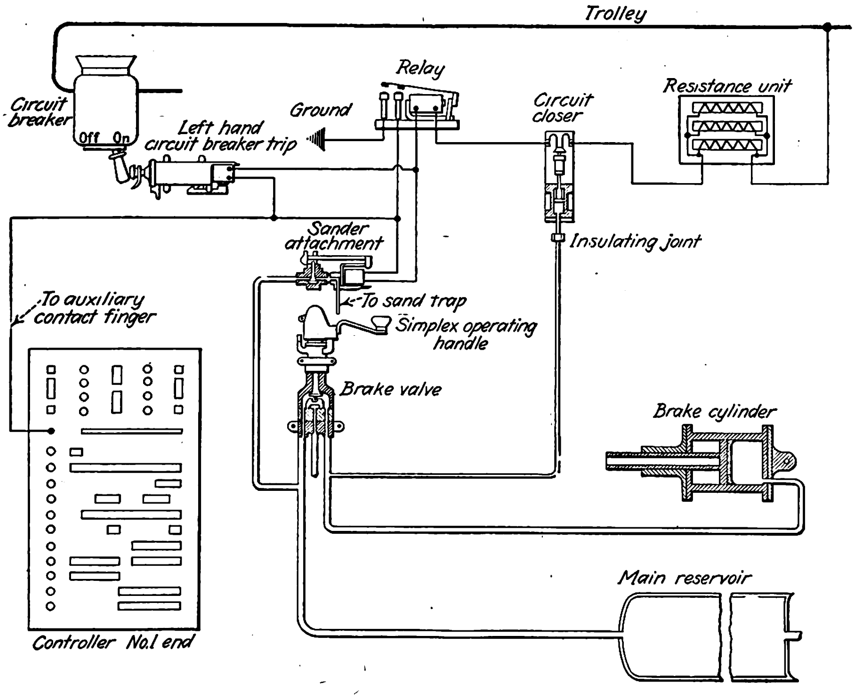


Diagram of Electrical and Air Pipe Connections for Simplex Safety System

To go back to the history of this installation, an article describing this type of safety equipment was read in the ELECTRIC RAILWAY JOURNAL for Dec. 23, 1922. A sample equipment was then secured by the Binghamton Railway and placed on one of the cars, the entire installation being accomplished by three men in about ten hours. During numerous tests made, under every possible condition of operation, the equipment worked satisfactorily, and was considered sufficiently good to warrant an invitation to the engineers of the Public Service Commission to inspect it. Such an inspection was made and resulted in several suggestions for improving the apparatus. The manufacturer took steps to overcome these objections and later the three trial installations of the improved apparatus were made.

The chief feature of the apparatus is the special operating head of the brake valve. This contains an automatic brake setting mechanism in the form of a strong spring, which is kept from functioning by a slight downward pressure exerted by the operator's hand. At first, this was the cause of some complaint from the platform men, who said that it made their wrists tired. To overcome the trouble, an entirely different type of handle was designed, and this has proved so popular among the motormen that the company is considering the installation of handles of the same type on its two-man cars.

As will be seen from the accompanying illustration, the brake handle differs from the ordinary straight lever which swings in a horizontal plane. It is, in fact, somewhat similar to a controller handle, in that a rounded knob is provided on which the operator's hand can rest. Years ago it was customary for the motorman to remain in a standing position while operating his car. At that time the brake valve was located quite low on the dash, so that the motorman's fingers could easily encircle a round lever projecting horizontally from the valve. More recently, however, there has been a tendency to place the brake valve higher and for the motorman to sit down to his work. This makes it rather awkward to grasp a handle of the ordinary type, but with this new handle the difficulty has been eliminated.

The other parts of the apparatus are very simple and easily understood by the average carhouse man. For a double-end car they consist of a resistance box, a circuit closer, two relays, two circuit-breaker trips, two electric sander valves and two special contact fingers and segments in the controller.

The removal of the operator's hand from the brake handle allows the spring to raise the handle, throwing the brake valve to the emergency braking position. This admits air to the circuit closer and also directly to the brake cylinder. The movement of the circuit closer energizes electromagnets in the circuit-breaker trips and in the sander attachments. Electric and air connections of this apparatus are shown in an accompanying illustration.

The apparatus differs from the ordinary safety control system in that the dead man feature is on the brake handle, under the operator's right hand. It is so arranged that he can remove his hand only when the brakes are set. He cannot, therefore, collect fares, make change or perform other duties which would divert his attention from the track ahead while the car is in motion.

Two of the advantages of this system are its ease of application to old cars and its freedom from freezing in winter. The apparatus is so simple that the installation can be made in a comparatively short space of time.

The Binghamton Railway did not lose the use of a car for a single day while putting on this equipment as it was possible to do all the work of installation between morning and evening tripper time. This was important as all of its cars are required for service during the evening peak. There are so few parts used in this equipment that its addition to the cars has not required any additional force of men to maintain it.

# Reinforced Concrete for Track Paving

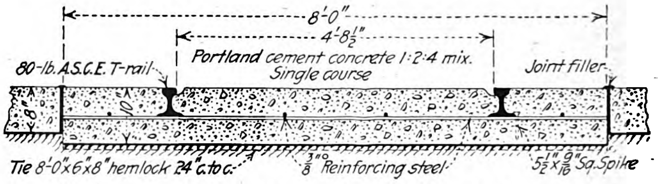
### Its Use Has Proved that It Is Beneficial in a Cold Climate Where the Track Is Subject to Heaving from Frost

By E. W. Jennison
Engineer Maintenance of Way Bangor Railway & Electric Company, Bangor, Me.

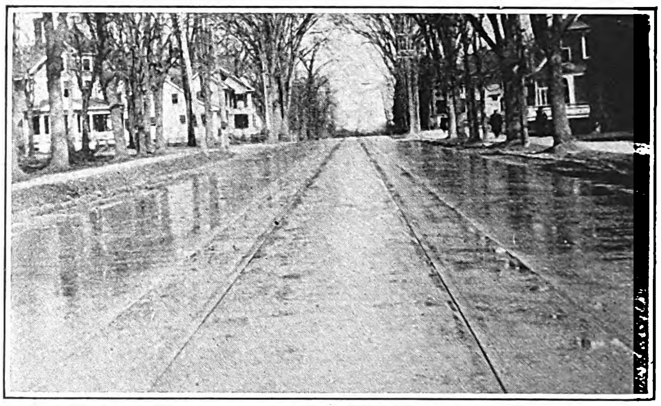
The reinforced concrete paving of the design shown in the accompanying illustrations was first installed in Bangor, Me., on Hammond Street, five years ago The only improvement in this design since 1919 has been the substitution of thermit welds for bolted joints, which took place in 1923.

There are several reasons for the design shown. The A.S.C.E. section of T-rail was chosen because it is standard, and it offers more wearing value for the money than either high T or girder sections. Since the track and paving structure should be a single unit, its low height enables the thickness of the paving to be kept at a necessary minimum. Cement concrete was chosen as it is the only satisfactory material by means of which the wearing surface and the supporting base for vehicle traffic can be combined in a single course, and it is also much cheaper in first cost than any type of blocks on a concrete base. It has also been found that snow cleaves much more readily from a concrete surface.

The native hemlock ties are used because their first cost is low, and when damp and not exposed to the sun we know that they have a life of from 20 to 25 years, which is about the life of the paving. Even should the ties decay and fail to support the rail before the paving is worn out, we feel that the concrete will support the rail inasmuch as we have practically a reinforced concrete tie between each two wood ties. It has been the experience here that when frost action takes place this design has heaved as a unit, and for the most part returned later to its original surface. This frost heaving is probably due to poor drainage. The rails are thermit welded, as this weld, in our opinion, gives absolutely continuous rail and will add years to the life of the rail as well as the whole structure over a type where bolted joints are used.



Section of Bangor Track with 80-Lb. T-Rail and Reinforced Concrete Paving



Appearance of Reinforced Concrete Paving in Bangor After Five Years' Service

All the track designs used prior to the one shown in the illustration had two real faults. The paving was broken up by frost action and the rail cupped at the bolted joints, which still further disintegrated the paving and the track structure. All these early designs have shown us that the track structure and the paving must be a single unit, particularly where frost action is experienced. Further, our experience with the type of construction shown, which was placed in 1919, has proved to the writer, who has had charge of the maintenance of way department since November, 1921, that all rail joints which are located in paved track should be welded.

# The Readers' Forum

## *Air Brake Handle Improvement Suggested by Operating Man*

NEW YORK CITY, June 3, 1924.

To the Editors:

As a motorman on the cars on ...... Avenue, I wish to make a little suggestion that will be of interest to the makers of air brake equipment.

I saw an accident a few weeks ago that was caused by the air brake handle slipping up so that the motorman could not stop his car in time. Now, if the air brake handle was made so that it could not slip up it would save many accidents.

A thumb screw might be put on to hold it down. What do your readers think about this question?

MOTORMAN.

[NOTE: The editors are not aware that many accidents have occurred because the air brake handle was lifted out in passing the central position. This would be unlikely to happen if the handle had a snug fit on the stem. Sometimes bushings in the handle or wedges have been used to accomplish that result. Any company that has trouble of the sort this motorman refers to is invited to inform the JOURNAL of its experience and the remedial measures taken so that some measure of the importance of the point raised may be had.]

## *Thinks No Disadvantage in Selling Auto Owner to Ride Cars*

THE BEAVER FALLS TRACTION COMPANY,
NEW BRIGHTON, PA., MAY 28, 1924.

To the Editors:

Your editorial "Seeking Patronage of Auto Owner Is of Questionable Profit" in the May 24 issue of the ELECTRIC RAILWAY JOURNAL is very interesting, especially so in view of our intense activity along the line of securing as many of the automobile owners as possible to ride upon our cars.

I feel that the summary in your closing paragraph is good reason for concentrating in our endeavors to secure the automobile owner.

There is no danger of the automobile being a thing of the past. There is no danger of there being a decrease in the total number of automobiles. They will increase, and the best that we can hope for is to secure a moderation in the use of the automobile.

There is a possibility of having such success that we will create a peak load for our cars which will result in the operation of additional cars and mileage with a decrease in net earnings, but I personally do not think that there is a strong probability of such a situation.

There are so many companies that feel the need of the patronage of the owner of the private automobile that I do not believe we need limit ourselves in our endeavors to secure this patronage. Moreover, I am of the opinion that the extensive use of the private automobile is chiefly in the non-rush periods. This might not be exactly true in the larger cities, because the rush-hour period is more protracted than in the smaller communities, and a mass of automobiles occupy the streets and their owners return home during the early portion of the peak-hour period.

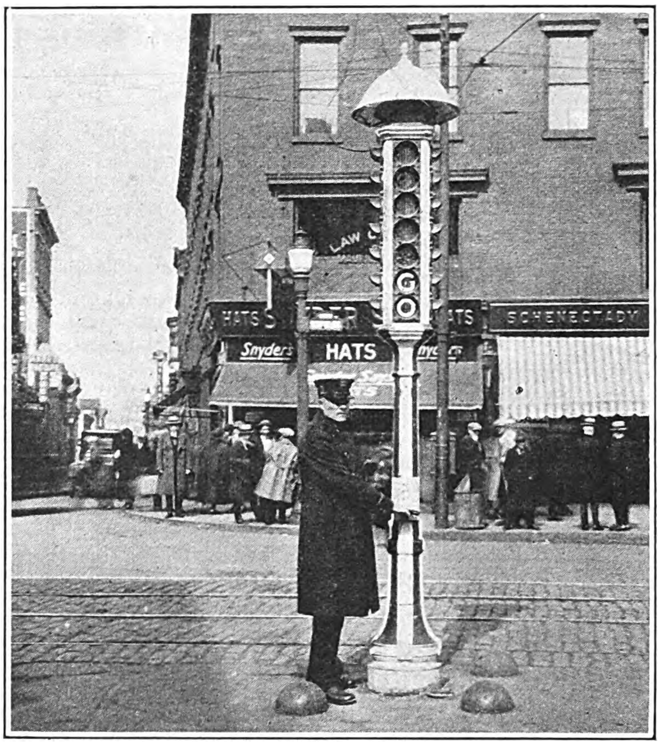
Should it develop that there is an extensive abandonment of the use of the private automobile and a corresponding increase in the use of the street car, it will be accompanied by such betterment to the finances of the street car companies that they will be able to give more serious consideration to the operation of two classes of service—de luxe coach service at a rate sufficiently high to warrant the convenience and the proper number of street cars with a street car schedule that is profitable.

I see no disadvantage whatsoever in going after the owner of the private automobile. The worst that can happen is that the transportation companies will have a monopoly of the business, but it will be under such favorable circumstances that they will be able to finance any class of service that is desired, be it street car, bus or aeroplane.

C. D. SMITH,
General Manager.

## Schenectady Has Novel Traffic Signal

THE latest thing in traffic signals is that illustrated herewith, which has been installed in Schenectady, N. Y. In all there are seven lenses mounted vertically on a substantial standard. The four lenses at the top are red and outline the word S-T-O-P when the lamps behind them are lit. The two lenses at the bottom are green and show the letters G-O. When traffic is heavy these six lamps are operated by the traffic officer who is stationed at the corner. The operation is similar to that with an ordinary semaphore signal, as shown in the illustration.



This Illuminated Signal Replaces the Semaphore, and Gives an Automatic Warning When the Officer Is Absent

The fifth lens from the top has an orange indication. When there is no traffic officer at the station, as in the early and late hours, this is operated automatically in place of the "stop" and "go" lights, flashing on and off continuously. The same signal indications are shown on all four sides of the tower, the lamp circuit being interlocked so that when the word "stop" is indicated on the two opposite sides, the word "go" appears on the sides at right angles.

# Association News & Discussions

## Safety Work in Providence

### Increased Number of Automobiles Means Greater Vigilance—Safety Board Established in Providence

AT THE afternoon session of the New England Street Railway Club, held at the Copley Plaza Hotel on Thursday, May 22, H. K. Bennett, safety manager of the United Electric Railways of Providence, spoke on the automobile hazard and, at the conclusion of his remarks, showed a number of slides which he has used in the safety campaign carried on in Providence. Mr. Bennett spoke extemporaneously, but, among other things, said:

"It is interesting, as well as appalling, in the light of present-day events, to note the growth of the automobile industry in periods of five years. In 1900 we find registered 13,824; in 1905, 77,988; in 1910, 468,497; in 1915, 2,445,666; in 1920, 9,231,941, and in 1923, 15,092,177. Please note that the gain in 1923 over 1922, numerically, was 2,853,802, which is 400,000 more than the total registration in 1915.

"From a mere pleasure vehicle the auto has become a necessity, both for pleasure and business, and it is not so much a question of when the point of saturation is going to arrive as how the rolling stock of the mighty army of automobiles is to be handled on the streets and highways of the country at the present time."

In speaking of automobile accidents, Mr. Bennett said: "In 1923 16,000 lives were lost in automobile accidents alone, an increase of 2,000 over 1922. Yet we call this a decrease rather than an increase on account of the nearly 3,000,000 more automobiles which were on the highways of this country. This figure, of course, does not take into account the large number of persons injured, which would be many times this figure. Sixty-five per cent of all street railway accidents involved automobiles."

Mr. Bennett then referred briefly to the safety work done in Rhode Island. He said that in May, 1923, a general safety board was formed on the property of the United Electric Railways, composed of the president and general manager, vice-president in charge of operations, superintendents of transportation, equipment, power and line, and bus operation, the general freight and general claim agents and the chief engineer (track), with the safety manager as chairman. This board meets twice a month. During the interim, suggestions are received from the employees and, when they are not within the scope of the safety manager, they are referred to the department having charge of such matters. At the meeting of the board, reports are received and the suggestions are either adopted or rejected. In any event, the originator of the suggestion is written to and given the reason why his suggestion is adopted or rejected. Of approximately 350 suggestions received during the first year, one-half were placed in effect, and 75 per cent of the rest were considered good but could not be adopted on account of the expense involved. The remainder were trivial matters. Prizes are given each month for the three best suggestions—$7.50 for the best, $5 for the second best and $2.50 for the third best. These are determined by vote of the board, but no one but the safety manager knows the originator of the suggestion until after decision is made as to prize winners.

The company maintains bulletin boards at its eleven carhouses and other division headquarters, on which are placed from time to time letters and posters which are calculated to aid in the diminution of accidents. There is a monthly paper, published by the safety manager, in which the accident situation locally is reviewed and dangerous locations brought to the attention of the blue uniform men, so that they may be on their guard. There are also contributions from each of the carhouses.

Mr. Bennett was very insistent that motor laws in the various states be standardized and that violations of such laws be punished without fear or favor. He urged the enforcement of existing laws through a sufficient number of officers so that the streets and highways could be adequately patrolled.

## Reasons for Increases in Accident Claims*

By JOHN J. REYNOLDS
Claims Attorney Boston Elevated Railway

FOR the purposes of this brief discussion we may understand that an "accident" is anything that happens or begins to be, without design, or as an unforeseen, undesirable or unfortunate happening, without the concurrence of the will of the person by whose agency it was caused.

It may thus be seen that an accident differs from a mistake in that the latter always supposes the operation of the will of the agent in producing the event, although that act of the will is caused by erroneous impressions on the mind. Therefore, if one applies this test to the generality of so-called accidents, it will not be difficult to classify a great many of them as mistakes and not as accidents.

Hence to refer to many such happenings as accidents is harmful, since it connotes excuse, when something much more drastic is necessary. One often hears the statement that accidents are bound to happen. The fact is, they are not bound to happen. They are usually the penalty of negligence, a blunder of omission or of commission, an error of observation or of judgment, the wrong lever pulled or the wrong button pressed, an order which miscarries, is overlooked or is misunderstood, a rule that is not obeyed, and the accident follows with speed and certainty. Some of the most serious and costly accidents have happened because necessary rules were not observed.

This should be all plain to employees, and it should be equally plain that the same lack of care on the part of the public is responsible for most of the accidents with which it meets. The report of the joint committee on accident prevention, read at the 1923 Atlantic City convention, is a most comprehensive survey on this subject.

To say that all accidents are potential claims does not express even a half-truth, in that the number of claims which may be made depends upon the number of persons involved in a given accident. This is a very important fact for those responsible for accidents and their prevention always to keep in mind.

There is also, strictly speaking, no market price for claims. No two claims are exactly alike nor of the same value. Each claim requires independent decision. Any one can settle claims if he pays enough money for them. To make reasonable compromise and decline others provides one of the most difficult, trying and least understood of all the positions in the railway business.

To understand the philosophy of the increased cost of accidents, frequent inquiry should be made into the conditions beyond the face of the figures, since this history is influenced by changing conditions and by situations over which neither the railway company nor its claims department has much if any control, and which tend invariably to operate to the financial disadvantage of the accident cost account.

It would seem that any economic consideration of this question should not lose sight of the following fundamental causes:

1. Adverse legislation.
2. Attitude of the community. (Agitation and development of ultra socialistic thought, propaganda, etc.)
3. Liberal interpretation of the law by the courts in favor of claimants.
4. Liberality of present-day juries, resulting in larger verdicts.

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*Abstract of paper presented at a meeting of the New England Street Railway Club, Boston, May 22, 1924.

5. Growing reluctance to set aside or interfere with verdicts on the ground of excessive damages or on other grounds.

6. Statutory deprivation of legal defenses existing prior to the enactment of adverse legislation.

7. Increase from $5,000 to $10,000 in the amount recoverable in death cases, with the omission of the requirement of gross negligence of the railway company and with interest from the date of the writ.

8. The enactment of a statute establishing a legal presumption of due care in favor of plaintiffs. (This statute now permits cases to go to the jury which before its enactment were excluded for lack of affirmative evidence of due care.)

9. In enactments of popular legislation there have been those who have been unable to appreciate or justly to estimate the true object or reason for the change. The workmen's compensation law for instance is illustrative of this, in that it produced in the mind of the general public the thought that no matter how an accident happened, the injured person, whether an employee or not, was entitled to receive compensation, the result of course being that accident costs went up.

One of the most striking of the modern causes of the growth of accident costs is the increase in wages of those who receive a weekly wage. For instance, a few years ago a laborer if away from his work for one week on account of injury lost from $12 to $14 in wages. At present, for the same period, he loses from twice to three times if not more than that sum, and all the bills accruing on account of accidents have increased in like if not, indeed, in greater proportion. And this is true, too, all along the line and includes physicians, nurses, medicines, damaged clothing, labor charges in vehicle accidents, including the $1.35 per hour for the automobile repair man, etc.

It was inevitable, of course, that this should all bring with it a sharp jump up in the cost of accidents.

Another great increase in accident costs is found in the case of accidents to the railway employee himself; this is doubtless several times more than the amount expended a few years ago for the same class of accident.

Another cause of the increase in the cost of accidents is due to the difficulties of operation chiefly on account of the density of automobile travel. To cite a single example, take the case of a careless chauffeur who cuts very suddenly in front of a car and forces the motorman to jam on his emergency brakes so suddenly that the electric car is put out of commission, even though the accident itself is avoided. A common result of such a near accident is to throw passengers in the car, injuring them, with resultant claims against the company.

The type of car and equipment is a factor in rising claims costs. For instance, with respect to witnesses, where a team, automobile or pedestrian gets upon the track and is hit by one of our middle-entrance cars, witnesses in the car are of little, if any, affirmative help, since the construction of the car is such that it interferes with passengers seeing what preceded the impact. This makes it a very difficult thing to determine in a great majority of cases, at least, just when the negligence of the vehicle driver or the pedestrian ceases after he has got upon the tracks, and the negligence of the motorman commences. In such cases one of the most important things to know is relative distances. Even with some of our semi-convertible type of cars such accidents at night leave us in the same position. Hence the great importance of getting street witnesses whenever possible.

From a claims standpoint, everything practicable should be done to keep cars from being started too quickly, or from jerking hard enough to throw passengers, whether this is due to poor or weakened conditions of resistance banks or other equipment defects, or to the negligent handling of the equipment by the operator. The type of accident generally classified as "falling in car" is altogether too numerous and is practically indefensible.

The question of the extent to which the type of construction of certain cars has been responsible for particular accidents is a matter which is receiving careful consideration at the present time, therefore need not be further adverted to here.

### How to Reduce Automobile Accidents

Now a few words with respect to automobile accidents. In no other class of accidents do we find the elements of carelessness, recklessness and other disregard for the right of others.

Electric railway companies have done everything possible to conserve the public safety, yet there is a tendency on the part of the public to demand protection without making a proper effort to protect itself. Consequently our trouble is mainly from without and not from within. To relieve this condition we must seek measures to protect ourselves from the suffering, from injury and from the expenditure of large sums of money in damages, by throwing around others a safeguard which they are unwilling to provide for themselves, or which they carelessly and negligently refuse to exercise. The time has come when we must prohibit the automobile and motor vehicle driver from using his own judgment (or misjudgment as is frequently the case) and surround him with restraining regulations for the protection of himself and others.

In view of this constantly increasing number of automobile accidents is it not also about time that a law were enacted that all applicants for a license to drive an automobile should have to pass a physical examination by a registered state physician as to their mentality, eyesight, hearing and general physical condition? Uniformity in state, county and municipal laws will help in the prevention of motor vehicle accidents.

In the Boston district it might be possible to have the Metropolitan Planning Board embrace in its study the lessening of this automobile hazard. Such a board might well work in conjunction with the city and town traffic commissions, to designate through intermunicipal thoroughfares, regulate traffic generally, prescribe penalties, etc. One requirement of such an arrangement would be that automobiles would be compelled to come to a full stop before entering a main highway.

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# Electric Locomotives Discussed by F. H. Shepard

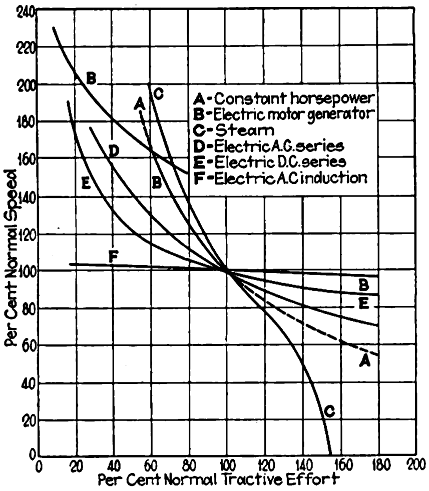
## The Types and Characteristics of Electric Locomotives Now in Use Were Classified and Interesting Comparisons of the Particular Types for Best Results Were Given

THE annual convention of the Mechanical Division of the American Railway Association is now being held at Atlantic City. At the session on June 13 F. H. Shepard, director of heavy traction for the Westinghouse Electric & Manufacturing Company, presented a paper on "The Development of the Electric Locomotive." Mr. Shepard gave three reasons why railway electrification in America has been slow. These were, first, the relatively high capital expenditure required together with the difficulties of railroad finance; second, the plentiful supply and the relatively low cost of coal, and third the lack of general understanding or definition of objectives for future railroad service. Throughout the world the number of electric locomotives for main-line service now in operation or under construction is 2,200 units, aggregating some 4,000,000 hp., and a table was presented giving their distribution, nominal horsepower, capacity, weights, and the electric system used.

An analysis of this table shows that 6.2 per cent in number and 6.7 per cent in horsepower are low-voltage d.c. locomotives; 31 per cent in number and 27.3 per cent in horsepower are high-voltage d.c. locomotives; 40.6 per cent in number and 36.2 per cent in horsepower are single-phase a.c. locomotives, and 22.2 per cent in number, and 29.8 per cent in horsepower are three-phase a.c. locomotives. Of the high-voltage d.c. locomotives, 18.7 per cent are in the United States and 48 per cent are in France. Of the single-phase locomotives 21.6 per cent are in the United States, and the remainder in Europe. Of the three-phase locomotives, 98 per cent are in Italy.

Mr. Shepard pointed out that the mechanical parts form the link between the electrical apparatus and the track and that the adequacy of their detailed design and the proper characteristics of the whole are essential to the success of an electric locomotive. He presented two very comprehensive tables giving data as to how the various designs have been made use of to meet the various requirements, and the various practices which have been evolved. These tables give data of construction, type, capacity and other important characteristics of all the locomotives built or building to date.

In commenting on these tables Mr. Shepard pointed out that within certain limits the electric system adopted and the service for which the locomotive is intended are the chief factors governing the fundamental design of electric locomotives. The electric system that is chosen and the service requirements determine the type of motor, its characteristics, its size and speed. The type of motor and restriction to driver weights determine the drive within limits and the drive will, in turn, together with the absence or presence of critical curvature, essentially determine the configuration of the rigid running gear. The necessity for auxiliary trucks will be determined mainly by the service requirements, chiefly that of speed, and presence or absence of critical curvature; but, in certain cases, this will be determined or influenced by the limit of axle loading or by placement of the driving motors or the placement and amount of auxiliary apparatus.



**Speed-Tractive Effect Characteristics of Locomotives**

The type and characteristics of motors were classified under three heads, the direct-current motor, the alternating-current series motor, and the three-phase induction motor. All three types lend themselves to regeneration. Mr. Shepard expressed his opinion that the induction motor is inherently the best for regeneration as it automatically, without additional apparatus for switching, separate excitation or regulation of any kind, becomes a generator whenever the locomotive, while descending a grade, exceeds the synchronous speed. No question of stability, flashing or expert manipulation enters into the matter. An accompanying chart shows the typical characteristics of the direct-current series, the alternating-current series, the alternating-current induction motors, and the direct-current series motors used with locomotive motor-generator sets.

The direct-current series motor, Mr. Shepard said, has certain advantages for certain applications owing to its torque-speed characteristics. As to speed control and as a generator it has disadvantages, all of which by additional apparatus and design have been successfully met. If used with a motor-generator set on the locomotive its limitations are further reduced. It lends itself particularly to subdivided power on account of its size and weight efficiency and it has an ease of grouping which partly offsets its speed-control limitations. The individual drive, therefore, will be found best adapted for the direct-current series motor. This can be the gearless direct drive, geared, axle hung, frame mounted with quill, or with universal rod and pin drive.

With the greater space requirements needed by single-phase series motors their use as direct gearless and for axle-hung mounting is restricted to the relatively smaller sizes, while for frame mounting with geared quill or universal drive, space limitations do not usually govern. The necessity for laminated structure, distributed windings or more brushes, together with the relatively lighter frame sections, adapts the single-phase series motor in its largest sizes to frame mounting with collective drive, by which one motor drives more than one driving axle.

The induction motor is adapted particularly for heavy service where constant speed is desirable due to its simplicity of control and for the attainment of the high weight efficiency with large motors. These make the collective drive the desirable one for this type of motor.

Mr. Shepard gave a very complete classification of the various drives in use on electric locomotives. The various forms outlined have been discussed in connection with details of various locomotive designs in previous issues of the ELECTRIC RAILWAY JOURNAL.

In conclusion Mr. Shepard said that the design and perfection of the electric locomotive are being given intensive consideration universally, and that while the amount of electrification in recent years has been relatively low, yet present activity indicates a continued development for future requirements.

## New York Electric Railway Association

EARLY registrations indicate that there will be a large attendance at the forty-second annual meeting of the New York Electric Railway Association, which will be held June 21 at Long Beach, N. Y. The headquarters will be at the Hotel Nassau. There will be a business and technical session in the morning, golfing and other entertainments for the men in the afternoon and a banquet in the evening. A special program of entertainment for the ladies has also been arranged. The program for the morning session, which begins at 9.30 a.m., is as follows:

Convention called to order.
Address of the president.
Report of the secretary and treasurer.
Reports of committees.
Appointment of nominating committee.

Paper, "Public Relations and Publicity," by James P. Barnes, president Louisville Railway. Discussion, led by Philip L. Thomson, publicity manager Western Electric Company, New York.

Paper, "The Motor Bus as an Auxiliary to Street Railway Operation," by L. H. Palmer, vice-president and general manager United Railways & Electric Company, Baltimore. Discussion, led by Vincent E. Keenan, superintendent of bus department United Electric Railways, Providence, R. I.

Paper, "What Electric Arc Welding Means to the Electric Railway Industry," by A. M. Candy, general engineer Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa. Discussion, led by J. W. Hulme, assistant superintendent car equipment Interborough Rapid Transit Company.

Paper, "What the Manufacturer Has to Sell to the Industry," by E. P. Waller, manager railway department General Electric Company, Schenectady. Discussion, led by A. J. Manson, manager transportation division Westinghouse Electric & Manufacturing Company, New York.

Report of nominating committee.
Election of officers.
Unfinished business.
Adjournment.

The annual banquet of the association will be held at 7 p.m. at Castle-by-the-Sea, which adjoins the Hotel Nassau.

The two speakers scheduled at the banquet Saturday evening are Roland B. Woodward, secretary of the Rochester Chamber of Commerce, and Robert S. Binkerd, vice-chairman of the committee on public relations of the Eastern and Southern railroads, New York City.

An especially interesting program has been arranged for the ladies on Saturday morning. Through the courtesy of Major General Bullard, they will have an opportunity to visit Mitchel Field at Mineola to inspect the hangars and flying machines there and to see some exhibit flights. The senior class from the West Point Military Academy will also arrive at Mitchel Field on the morning of June 21 for instruction in aviation. The committee on entertainment announces that buses for Mitchel Field will leave the Nassau Hotel promptly Saturday morning at 9:30.

On Saturday afternoon card games have been arranged for the ladies and there will be dancing following the banquet.

The golf tournament for the men in attendance at the convention will be held at the Lido golf course on Saturday afternoon. Suitable prizes will be awarded.

## Iowa State Convention

THE annual convention of the Iowa Electric Railway Association will be held in conjunction with the Iowa section of the N. E. L. A. at the Wahkonsa Hotel, Fort Dodge. The N. E. L. A. will hold sessions June 24 and 25. There will be a joint session Thursday, June 26, and a separate railway session the same afternoon.

### Internationaler Strassenbahnverein

THE 1924 convention of the Internationaler Strassenbahnverein (Street Railway Association of Central Europe) will be held this year at Homburg v.d. Hohe, Germany, on Sept 4 and 5. It will precede a meeting at the same place of the German Street Railway Association on Sept. 6-7. The following program of papers has been arranged:

"One-Man Cars," by T. E. van Putten of Amsterdam, Holland, and E. Hultman of Malmo, Sweden.

"Standardization of Track Construction and Track Maintenance," by Paul Goetz of Leipzig.

"Control Systems," by K. Pforr of Berlin.

"Yearly Car-Mile Performance of Transportation Employees," by K. Norregaard, Copenhagen, Denmark.

"Tendencies in Legislation in Different Countries in Regard to Hours of Labor of Transportation Employees," by Dr. M. Mumssen of Hamburg and Dr. A. Patz of Budapest.

"New Designs of Street Railway Motors with Inclosed Lubrication," by F. G. Wellner of Bielitz.

"Motor Ventilation," by E. Nier of Dresden.

"Lubrication of Gears and of Ball and Roller Bearings," by Dr. E. Vidéky of Budapest and K. Pforte of Hagen.

"Magnetic Track Brakes," by Jorgen F. S. Barth of Christiania.

"Street Railway Fares in Non-Expanding Territory," by A. Winter of Vienna.

"The Destructive Competition of Electric Railways by Automobiles," by Hermann Geiser of Schaffhausen.

"Betterments on the Zürich Railway System," by Carl Wick of Zürich.

## American Association News

### Equipment Committee

A VERY busy session of the equipment committee was held at the association headquarters in New York, June 6 and 7. Those present were F. H. Miller, chairman; Daniel Durie, sponsor; W. S. Adams, W. W. Brown, R. S. Bull, A. T. Clark, J. M. Hipple, J. F. Miller, E. S. Sawtelle, P. V. C. See, R. B. Smyth, C. W. Squier, W. G. Stuck, J. McCune, J. L. Gould and L. H. Fry. G. L. Schermerhorn represented E. D. Priest and W. H. Phillips was present as a guest of the committee.

Final reports were made by the various sub-committees and these were discussed, corrected and approved for use in the final report of the committee. The subject of car gearing was reported upon and a summary of answers to a questionnaire will be included in the final report. A table of sizes and locations for the web holes in gears was decided upon and will be recommended for standardization. The use of various devices for trolley contact and the effect upon trolley wire have been studied in co-operation with the power distribution committee. A tabulation of replies to a questionnaire will be included in the committee's report, together with a summary of present practice.

A very thorough review has been made of the Manual sections on equipment under the heading of Miscellaneous Methods and Practices, and as a result of it, the following have been revised and rewritten and will be included in the final report:

Inspection of brakes, air compressor maintenance and inspection, comparison of car weights with seating and carrying capacities, repairs of armatures, maintenance of commutators, insulating materials for railway repair shop use, inspection and lubrication of gears and pinions, protective devices for car equipment, lubrication of motors, armature and axle liners, specifications for trolley wheels, carhouse organization and rules for lubrication of various equipment.

Former miscellaneous methods and practices for overhauling and inspection of electrical equipment and rules for inspection of equipment parts were reviewed. Such equipment parts as are not covered in other sections are to be combined into a new miscellaneous method and practice. The section on wires and cables for trolley equipment was examined, but final report cannot be made until the subject of car and carhouse wiring has been disposed of by the National Fire Protective Association. The subject of slack adjusters will not be included as a recommended miscellaneous method and practice, but answers received from a questionnaire on this subject, with a summary of results, will be included as a part of the equipment committee's report. It was recommended that the specifications for wrought-iron bars and limit gages and that for proof testing of forgings to determine their soundness after quenching and tempering be advanced from a miscellaneous method and practice to recommended specifications.

Results of a questionnaire on spring supports for railway motors was presented. This will be summarized for final recommendation. A study was made of existing practices in the matter of inspection periods for car axles and a new set of rules was developed for inclusion in the Manual under the heading of Miscellaneous Methods and Practices.

The report of air brake tests conducted under the auspices of the Central Electric Railway Association has been studied by this year's committee. A report of this study was made by the sub-committee and various parts will be included in the final report as desirable information.

The committee appointed to consider the question of a standard nomenclature for controlling the dimensions of motor coaches has met with a similar committee from the Society of Automotive Engineers and has arrived at certain decisions which will be included as a part of the committee's report.

Considerable time has been spent by this year's committee on a revision of standards. Revisions of the following have been decided upon and will be submitted for consideration: Brake shoes, brake shoe heads and brake shoe keys, limit of wear gage for flanged contours, specifications for refined wrought-iron bars, specifications for quenched and tempered carbon steel axles, shafts and similar forgings. Several other equipment standards have been studied and information tending to their revision has been collected, but the work has not advanced sufficiently so that definite recommendations for revision can be made by this year's committee.

### Way Matters

REPORTS of ten sub-committees were discussed and put in final shape for publication at a two-day meeting of the committee on way matters June 5 and 6. The sub-committee on standardization of frogs has this year given attention particularly to limiting the number of branch-off frogs. A simplified system, taking the seven layouts that are now standard for the 40-42.5-50-60-70-90 and 130-ft. center radius curve, and using them for all intermediate radii by holding the alignment up to and through the frog, compounding at that point with the desired center radius, is recommended for standard gage track. For wider gages the alignment is modified so as to hold the same frog angle. This gives a choice of twenty-three curves with only seven frogs and with alignments varying only slightly from those in Ws-10-b. The subject of standardization of frogs for car clearance curves is recommended for study by next year's committee.

The subject of substitute ties has been carefully studied this year by a special sub-committee. Extensive investigations have been made to determine the extent to which substitute ties have been used and the results that have been obtained. Definite conclusions cannot be drawn from the information available, however, and it is recommended that the subject be continued by next year's committee.

In a discussion concerning welded rail joints, J. W. Welsh, secretary American Electric Railway Association, and W. Spraragen, secretary of the committee on welded rail joints, participated. The sub-committee recommended that the subject be continued for consideration next year in conjunction with the committee on welded rail joints. The latter committee is urged to adopt a definite program for future work and to proceed with it as rapidly as possible. It was thought that publicity should be handled as far as possible through the official organ of the A.E.R.A. and the technical press of the railway industry. The executive committee of the welded rail joint committee will be asked to submit monthly bulletins of its activities to members of the main committee. The committee thanked Mr. Spraragen for his attendance at the meeting and for his cooperation in this work.

Some minor changes in specifications

were recommended by the sub-committee on specifications and design of tie rods. Difficulties found in manufacturing the proposed $\frac{9}{16}$-in. spike were discussed following the report of the sub-committee on design of a hook head railroad spike. A few slight changes were made in the report submitted by this sub-committee at the previous meeting.

Another sub-committee reported as its conclusion that there is no need for narrow groove guard rail and recommended that the subject be discontinued. A crossing such as shown in the report of the sub-committee on manganese crossings was recommended. It was decided that cutting the through-running rail shall be optional on bolted crossings. After considerable discussion it was decided to make the flange bearing in the electric run optional in the bolted crossing design. Charts and diagrams were submitted by the sub-committee on the standardization of switches and mates, but the committee did not attempt to pass on their correctness.

Interesting data were presented concerning experience in various places with surface hardened rail. It is considered, however, that the subject is still in an experimental stage and no definite recommendations were made. A number of minor changes in existing specifications were suggested by the sub-committee reviewing that subject.

After the discussion of the reports of the sub-committees the subject of exhibits at the coming annual convention at Atlantic City was brought up. The question of subjects for study by next year's committee was briefly considered, but the matter was left in the hands of the chairman.

The members present were: H. H. George, chairman; C. F. Gailor, E. M. T. Ryder, W. W. Wysor, V. Angerer, E. B. Entwisle, A. T. Spencer, C. A. Alden, J. B. Tinnon, R. B. Fisher, J. H. Haylow and R. C. Cram, sponsor.

## Heavy Traction

A MEETING of the heavy traction committee of the Engineering Association was held in New York on June 5. The meeting was devoted to the annual report to be presented at the Atlantic City convention.

The sub-committee on revision of the bibliography on heavy electric traction, Mr. Brown chairman, reported that arrangements have been made for preparation of the work during the coming summer by Professor Warner.

Mr. Armstrong presented a report of his sub-committee on branch-line electrification and self-propelled cars, which was accepted for incorporation in the annual report.

On the subject of train operation, Mr. Sinclair presented a report on articulated trains, with a number of diagrams. It was agreed that all this information should be published in the report.

Connections between cars, particularly automatic couplers, was the subject of the sub-committee headed by Mr. Daus, who gave a report summarizing replies to a questionnaire that his sub-committee had sent out.

On the subject of revision of standards, Mr. Skelly read a report by Mr. Wells, stating that no changes are contemplated from present practice.

Members present at the meeting were: J. C. Davidson, chairman; A. H. Armstrong, H. F. Brown, Morris Buck, H. W. Cope, A. H. Daus, E. P. Chase representing J. V. B. Duer, Norman Litchfield, J. O. Madison, J. J. Sinclair, J. J. Skelly representing L. S. Wells.

## Power Transmission and Distribution

A MEETING of the committee on power transmission and distribution was held at association headquarters, New York City, June 2, 3, and 4. Those present were C. H. Jones, chairman; M. B. Rosevear, sponsor; J. W. Allen, R. L. Allen, James H. Drew, R. W. Eaton, Charles Gilman, C. L. Hancock, H. D. Hawks, C. J. Hixson, Adrian Hughes, Jr., C. P. Nachod, F. McVittie, H. S. Murphy, J. F. Neild, W. J. Quinn, W. Schaake, A. Schlessinger, J. M. Waldron, F. J. White and G. C. Hecker of the association staff. Those present as guests were Mr. Flynn of the Drew Electric Company, D. A. Tomlinson of the Portland Cement Association and L. W. Birch of the Ohio Brass Company.

The subject of inductive co-ordination was discussed, but no report will be made at this time. It was recommended that this subject be carried over for another year. It was decided that certain parts of a report on temporary connections to trolley wire by a senior engineering student at Purdue University be included in this year's report with proper credit. It was decided to recommend continuing this subject.

A brief statement of the status of each standard now included in the Manual will form part of the report of the committee this year. Some further data have been accumulated in regard to the wear on trolley wire and this will be included in the report, with the recommendation that the subject be continued next year.

An attempt has been made to harmonize and standardize the matter of aspects of signals used in overhead contact systems. The work on this subject has not been completed and a recommendation will be made for its continuation for another year.

The committee has prepared new specifications for the manufacture of concrete poles and the formulas and calculations in Manual Section Ds-3c have been checked. The committee will recommend that the specification be submitted for consideration and, if approved, that it be substituted for a corresponding portion of the Manual section.

The sub-committee on ruling dimensions of barn hangers has standardized ruling dimensions of shallow and deep hangers, the distance between bolt holes for support and the distance between the top and end of stud-bolt. The committee considered it inadvisable to standardize the ruling dimensions of the approach ears of bolted types.

The subject of overhead construction of trackless trolleys has been considered by the committee this year and two installations will be reported upon with the recommendation that the subject be dropped until new developments occur. The subject of catenary overhead construction and material will also be recommended for continuation.

## Power Generation and Conversion

A MEETING of the power generation and conversion committee was held at association headquarters, New York City, June 9 and 10. The following were present: W. E. Bryan, vice-chairman; C. E. Bennett, C. A. Butcher, H. W. Codding, W. R. Herod, V. H. Mueller, F. W. Peters, R. L. Webber and G. C. Hecker of the association.

A twenty-page report covering the subject of ventilation and noise-proofing of automatic substations was taken up and discussed. This report outlined the general phases of the situation with a description of the method of ventilation used by various companies at the present time. In view of the fact that several tests of various kinds of ventilation will shortly be made on an extensive scale and that the results of such tests should be available during the coming year, the committee recommended that the subject be continued.

The question of codification of power troubles was discussed, but inasmuch as this subject involved distribution and transmission problems it was decided to suggest that the whole matter be referred jointly to the power generation and conversion committee and power distribution committee next year.

A report of the committee on review of existing standards was received, with the recommendation that the specification in Manual Section Gb-2a, "Form of Contract for Purchase of Fuel," be revised during the coming year to bring it up to present practice; that Manual Section Gb-3a on the boiler code have a footnote placed in the Manual approving the 1918 revision by the American Society of Mechanical Engineers. Certain minor changes were presented in the specification for boiler tubes, which are now under review by the American Society for Testing Materials.

Current practice in the design and operation of automatic substations was taken up and discussed, and reports were submitted on shunt-wound and compound-wound synchronous converters for various classes of service, semi-automatic substations, direct-current feeder control and supervisory and remote control systems.

## Buildings and Structures

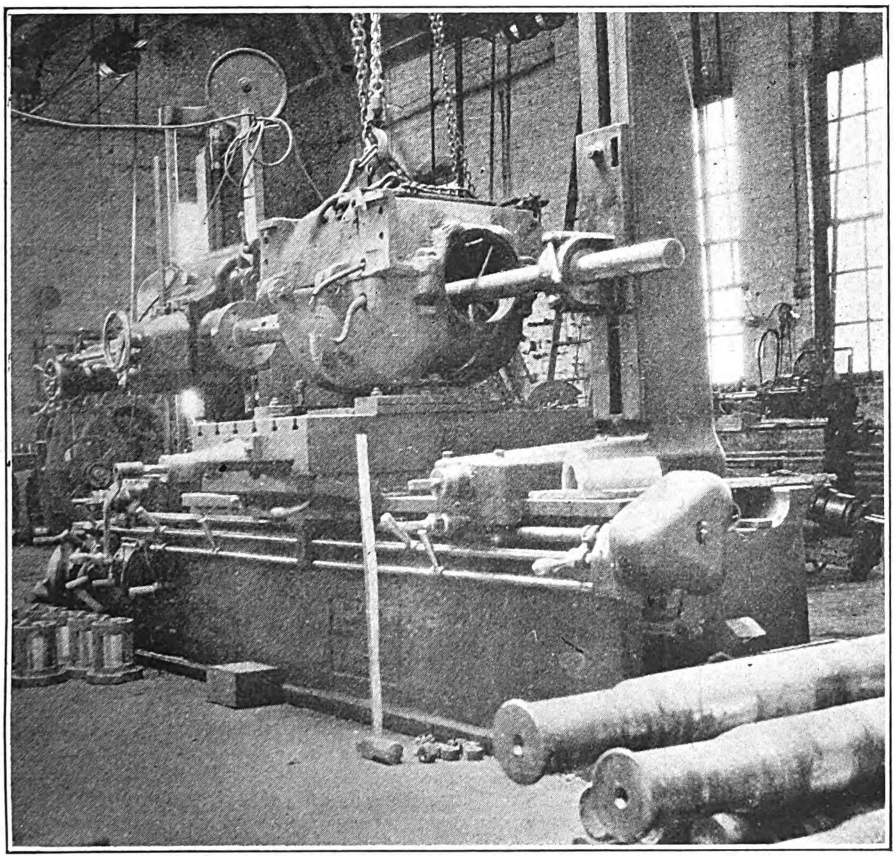
REPORTS submitted by the various sub-committees were discussed and put in shape for publication at a meeting of the buildings and structures committee of the Engineering Association held at association headquarters, New York, June 2 and 3. During the course of the year this committee has been able to cover practically all of the work planned. New subjects suggested for the consideration of next year's committee included terminals for motor buses, garages, carhouses and carhouse standards. The design of buildings for the storage and maintenance of buses, a subject which was studied by this year's committee, will be continued next year. Those present were: N. E. Drexler, chairman; E. D. Eckroad, J. D. Kent, T. H. Stoffel and H. R. Stamm.

# Maintenance of Equipment

## New Boring Mill Cuts Cost in Half

A LAMBERT horizontal boring machine, which has been in use in the Fulton County plant of the Georgia Railway & Power Company, Atlanta, Ga., since August, 1923, has reduced by more than 50 per cent the cost of doing certain classes of work. Comparing the boring mill with a lathe, it has been found that the cost for reboring a GE-80 motor is now $5, as against $11.20 by the older method. A saving of 50 per cent has been accomplished in boring axle bearings. Air compressor cylinders are rebored in 7½ hours less time. In cutting keyways a saving of 75 per cent has been accomplished over the work formerly done by a shaper.

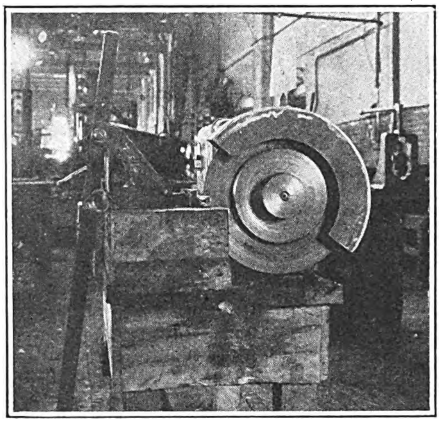
This boring mill is a single spindle machine. The spindle can be raised or lowered and a motor frame can be moved perpendicularly to the spindle on a horizontal plane. Thus axle bearings can be rebored as well as the armature bearings. Approximately 40 GE-80 motors have been rebored recently and similar work is now being done on Westinghouse No. 101 motors. All reboring is done to a larger size than the original hole.



This Boring Mill Has Accomplished Big Savings for the Georgia Railway & Power Company

## Convenient Machine for Cutting Conduit

THE New York Central Railroad has found a home-made conduit cutting machine of great convenience in its Harmon shops. A steel disk 16 in. in diameter and ⅛ in. thick is used to cut the conduit. This disk is mounted directly on the shaft of the motor portion of a D2 E G air compressor. The cutting disk is clamped between two larger disks, 10 in. in diameter by ⅝ in. thick. A nut 4½ in. in diameter fits on the end of the shaft for clamping. This is tightened by means of a spanner wrench. The 10-in. disk, which fits on the outside of the larger cutting disk, is also used for grinding off burrs and smoothing the edges of conduit after it is cut.

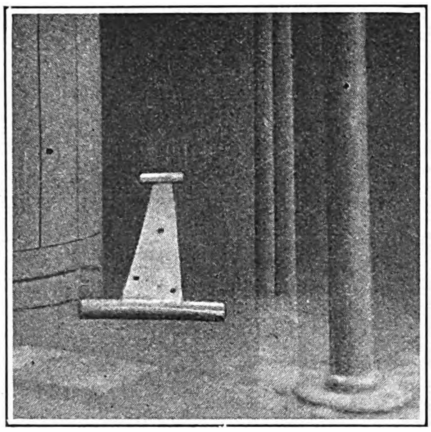


Cutting Conduit with a Steel Disk

The machine is mounted on a wooden bench and the equipment for feeding the conduit into the cutting disk is also mounted on wooden blocks. The conduit is forced against the cutting disk by a lever with its fulcrum about 12 in. above the center of the cutting disk. This lever extends down to within 3 or 4 in. of the floor and is provided with a pedal, so that the operator can place his foot on this and exert sufficient pressure to force the conduit against the steel disk and cut it without difficulty. The operation of the lever slides a block back and forth and the conduit is placed between this and the cutting disk. The lever provides sufficient movement so that conduit up to 2 in. diameter can be cut. The operating lever is made of 3½-in. by ½-in. iron and the bracket, which serves as a fulcrum, of sheet steel ⅛ in. thick. The compressor motor is operated on a 500-volt circuit, three heater coils being installed to cut down the voltage and reduce the speed of the motor. An ordinary car hood switch is used for cutting the compressor in and out.

## Hinge Provides Rest for Motorman's Foot

A SIMPLE method has recently been adopted by the Nashville Railway & Light Company, Nashville, Tenn., to make the work of a safety car operator easier by relieving him



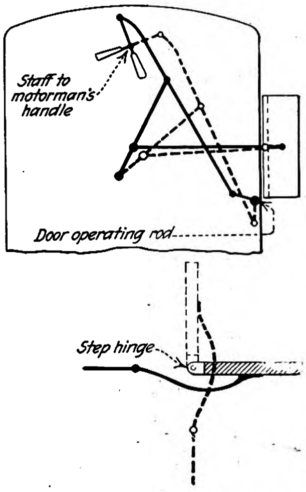
**A Light Pressure on This Hinge Is All that Is Required to Keep Down a Safety Car Foot Valve**

of the necessity of keeping his foot on the plunger when his hand is removed from the controller handle. A 9-in. T-hinge is screwed to the floor near the base of the controller, with the strap resting against the foot plunger, as shown in the accompanying illustration. A short piece of ¼-in. steel rod has been riveted across the end of the strap. The safety car operator can rest any part of his foot against this hinge and by a light pressure keep down the foot valve with less exertion than would be necessary if his foot were resting directly on the plunger.

## Proper Leverage Makes Door Operation Easy

In rebuilding some of its single-end cars for double-end operation, the Savannah Electric & Power Company, Savannah, Ga., paid particular attention to making the door operating mechanism work easily. These cars were of a comparatively modern type, with open rear platforms. The reconstruction was simplified by the fact that the rear platforms had control and air-brake apparatus already installed. This had been done to facilitate moving the cars around the carhouses and yards, where it was frequently necessary to back up. Platforms at both ends were closed in and were equipped with manually operated doors and folding steps.

An unusual arrangement of levers designed by E. T. Smith, master mechanic, has been used under the platform to control the movements of doors and steps. The front exit door is controlled by a system of levers as shown in the accompanying sketch. The step is raised and lowered by an auxiliary arm the movement of which is at right angles to the length of the car. This arm is attached to the underside of the folding step in such a way that an outward push folds up the step and an inward pull lets it down. This method of operating the step requires a minimum of physical effort on the part of the motorman.



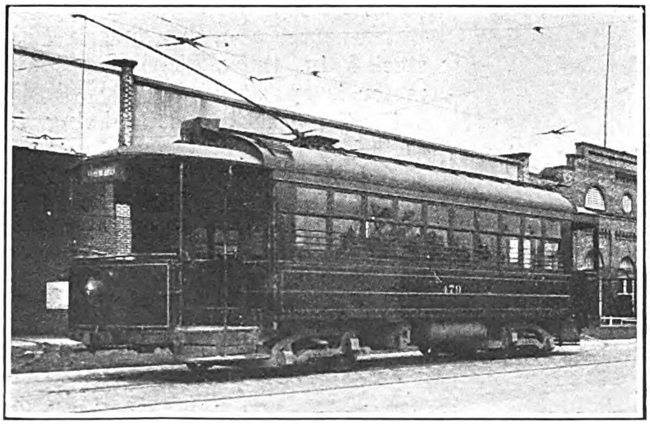
**Arrangement of Door and Step-Operating Levers Under the Platform**

On the rear platform double entrance doors and a folding step are controlled by a single bellcrank with three-lever attachment. One goes to each of the two door-operating rods, and the third operates the folding step in a manner similar to that already described. The two ends of the car are identical in door and step arrangement. Since the adoption of this plan, complaints by the trainmen of doors working hard have been entirely eliminated.

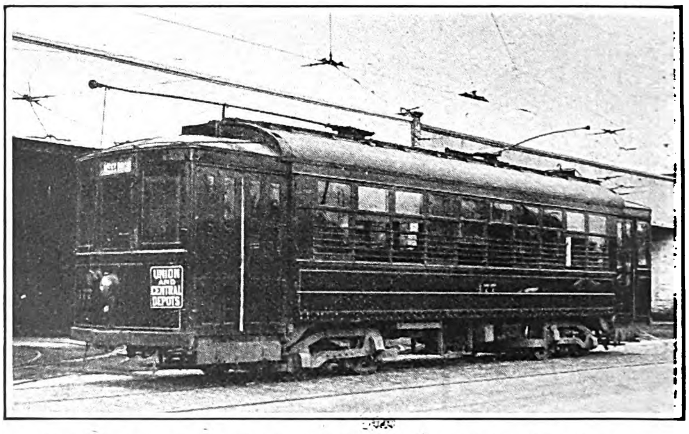
Numerous stanchions are provided around the entrance and exit, so that passengers will not pause to look for a grab handle when boarding or alighting, but will find a stanchion convenient and proceed to get in or out at once. The stanchions have been placed about 6 in. back from the edge of the platform, on the theory that passengers are inclined to pull themselves into the car when getting on.

## Tightening Commutators

Some suggestions for tightening commutators were given by Burton E. James, Westinghouse Electric & Manufacturing Company, in the issue of *Electric Journal* for December, 1923. A good way to test commutators for loose bars is to tap them with a hammer. If a dull sound instead of a ring results trouble will probably develop. Another evidence of looseness is a white, chalky substance sifting out from between bars. This is powdered mica caused by the vibration of the bars and consequent chafing of the mica. This vibration may lead to fatigue cracks and ultimate failure of the bars. Small commutators are best tightened by putting the armature in a lathe and using a special wrench or key to turn the commutator nut or bolts. If it is impossible to get the commutator tight and obtain the desired ring from it



**Cars of This Type in Savannah Are Being Rebuilt with Inclosed Platforms**



**Both Ends Are Identical and Equipped with Folding Doors and Steps**

the mica has evidently disintegrated or been chafed and the only remedy is a new set of bars and mica.

When a small number of bars require replacement this can be accomplished sometimes without removing the commutator from the shaft, but when an entire set of bars or the rear mica V-ring must be replaced, it will be necessary to press the commutator off the shaft. The leads may be removed from the commutator necks by driving a steel drift into the top of the slot and using a gouge to remove the filling pieces and top leads, after which there is room enough to bend one side of the necks slightly and gouge out the lower leads. The melting out of solder with a blow torch is not recommended, as the hard-drawn copper bars are liable to be annealed or the insulation is liable to injury due to getting solder into the winding.

After the leads are removed the commutator or armature should be placed on end, with the commutator end up and ring nut or bolts loosened. Each piece should be marked so that it can be replaced in its original position. After the metal and mica V-rings are lifted out the bars which are to be replaced should be tapped until loose and then removed. New individual bars must be carefully filed to the exact shape of the bars they replace or the repaired commutator will be worthless. Dirt and moisture must be kept out of the commutator while repairing. After the new parts are inserted the metal and mica V-rings may be reinserted and the nut or bolts brought up fairly tight. The commutator should be heated to approximately 120 deg. in an oven and then be given a final tightening while hot.

## Outside Storage Increases Maintenance

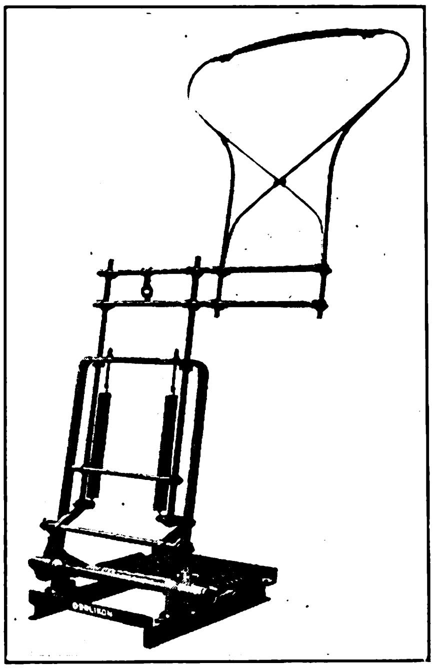
THE master mechanic of a company, which uses both outside and inside storage declares that there is a very marked difference in the amount of maintenance required by cars in outside storage as compared with those stored inside. Cars in outside storage have to be painted at least three times as often as those with inside storage. Moreover, the side of the car exposed to the sun, in outside storage, changes in color as compared with the side not exposed to the sun. There is also a tendency of the side posts of the car on the sunny side to get dry rot.

The advantages of inside storage have recently become particularly noticeable with twelve trailers acquired at the same time, six being kept in outside storage and six in inside storage. Within six months there was a great difference in the appearance of these cars, those stored inside being in much better condition.

# New Equipment Available

## Different Trolley Voltages Over the Same Track

IT IS NOT often that trolley wires carrying different voltages are used over the same track. This condition arose, however, recently in connection with suburban service which was operated on some main line track near Uetliberg, Switzerland.



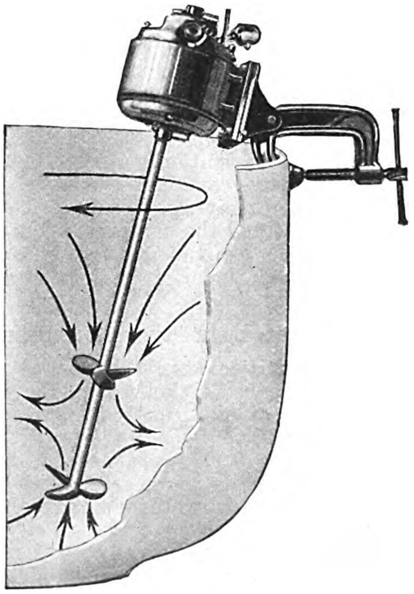
Offset Bow Collector for a Second Set of Trolley Wires

The track on which it was desired to operate this local service is equipped with a 15,000-volt, 16⅔-cycle, single-phase trolley to serve the trunk line electric locomotives which operate over this line. As 1,200 volts d.c. was considered more desirable for suburban service, a second trolley was installed 1.3 m. (51 in.) off center but at the same height, and current is collected from it by an Oerlikon side contact bow trolley. This construction has been in operation for about a year with satisfactory results. A view of the collector is shown.

The motor car used in this suburban service is double ended so that the offset of the trolley pole does not interfere with operation in the reverse direction, provided the motor car is not reversed at the end of the line.

## New Portable Paint Mixer

A PORTABLE mixing machine which can be clamped to a tank or tub in which the liquid is to be mixed has recently been brought out by the Alsop Engineering Company, New York, N. Y. With the mixer in position a shaft on which is mounted two propellers extends down into the liquid. The bottom one pulls up the ingredients from the bottom of the tank so as to bring them into solution with the liquid, which is forced down by the top propeller. In this way the intermixing is accomplished beneath the surface of the liquid. All moving parts with the exception of the shaft are outside of the liquid.



Portable Mixing Machine Mounted on Tank

The mixer is made in four sizes and with varying lengths of shafts to meet the dimensions of the tank. The motor sizes range from $\frac{1}{16}$ to $\frac{1}{3}$ hp.

# The News of the Industry

## Detroit Case Closed

### Decision of Court Expected Soon in Suit Seeking to Compel City to Deal with Union

Arguments in the suit brought by the union officials to compel the Detroit Street Railway Commission to deal with them as representatives of the men have been brought to a close. Judge Theodore J. Richter, who heard the union's petition for a writ of mandamus to force the city to arbitrate the men's demands for increased wage scale and improved working hours, has advised the attorneys he would file his written opinion within a week. He set June 10 as the final date for the attorneys to file their briefs.

### ATTEMPT AT COMPROMISE FAILS

A last attempt to effect a compromise in the suit failed after Judge Richter adjourned the hearing and instructed the attorneys on both sides to confer with their principals and consider arbitration. The street railway operating officials declined to deal with the union, but indicated a willingness to arbitrate with representatives of the men themselves.

Letters were sent to the twenty-three members of the platform men's committee by Ross Schram, assistant general manager of the municipal railway, inviting them to meet the Street Railway Commission on June 10 to discuss preliminary organization plans in an effort to settle the wage controversy. It was announced that arbitration would not be discussed at the meeting, in order not to interfere with the case pending in the Circuit Court.

Four of the twenty-seven members of the employees committee selected on May 29 have resigned. They were not invited to attend the conference and no union officials are members of the committee. Each member will represent a certain city line.

### MANY IMPORTANT POINTS DISCUSSED

The committee was selected at an election in the carhouses under the supervision of the D. S. R. management, and although only 470 votes out of a possible 3,900 were cast, it was announced by the commission that the committee chosen would be recognized by the street railway commission and executive heads of the railway as representing the men. The commission expressed willingness to hear any matters the committee may bring up, including demands for increased wages and improved working conditions. It is estimated that, failing an agreement between the commission and the executive committee, the city will be willing to arbitrate the differences through appointees of the committee.

Many interesting facts were brought out during the hearing before Judge Richter. One point established was that the national union was financing the suit for the men. The commission contended that if it is forced to deal with the union officials in matters concerning D. S. R. employees, it would be tantamount to being compelled to deal with the employees of the Detroit United Railway, a private corporation, which has no connection with the municipal government. The union has claimed the right of spokesman for the rank and file of D. S. R. workers because of its membership, alleged to be in excess of 90 per cent of the number of conductors and motormen. It was brought out during the hearing that the Detroit United Railway had objected to the same agent that handled the D. S. R. cases being permitted to handle D. U. R. grievance cases and that last February the union employed another business agent to handle D. U. R. matters. Of the 4,300 members of local No. 26 there are about 600 D. U. R. employees.

It was admitted by the secretary of the local union that three international union officers and two of the local union were present when the petition for a mandamus was drafted, and that he signed the petition before the expiration of the time limit given the commission by the union to comply with the union's demands to deal with it.

Ross Schram, assistant general manager, when asked concerning the Street Railway Commission's attitude toward recognition of the wage demands of the car men and of arbitration, reiterated his previous statements to the effect that the commission did not see any reason for it.

## Strike at Cleveland Postponed

### Men Put Off Walk-Out on Account of Republican Convention—Action Threatened for June 16—Efforts Continue to Avert Cessation

THE local union in Cleveland, by a vote of 1,587 to 53, decided at a mass meeting on the night of June 6 to call a strike effective at midnight Tuesday, June 10. This would have meant a tie-up of Cleveland's transportation system in the very midst of the Republican national convention.

At the request of City Manager W. R. Hopkins and on instructions from W. B. Fitzgerald, international vice-president of the union, and Edward MacMorrow, member of the international executive committee of the union, the strike was postponed until after the G.O.P. convention adjourned Thursday night, June 12.

Efforts to avert a strike were still under way on June 12, but the union and the Cleveland Railway considered a cessation of service so imminent that both were keeping up their preparations for a walkout.

The strike vote was taken when John J. Stanley, president of the Cleveland Railway, informed the men that he would never grant the award increasing wages 12 cents an hour made by the majority members of the board of arbitration, from which the two company members had withdrawn on the ground that the fifth and "neutral" member of the board was biased and prejudiced in favor of the men.

Mr. Stanley has made all preparations in Cleveland for a strike. Cars have been armored with wire netting, cook stoves and cots have been installed in the carhouses, and approximately 500 men are already on hand, ready to replace a similar number of the 2,500 platform men of the company in the event of a walkout.

Efforts of the car men's union to have the City Council intercede in behalf of the men resulted in the passage of a resolution by the Council on June 9 calling on the company to stop armoring its cars. Mr. Stanley announced immediately after this that he would continue his efforts to protect the company's property if the men walked out. The City Council also adopted a resolution authorizing its railway committee and the city manager to subpoena Mr. Stanley to meet with it and union officials in an effort to mediate the differences. Mr. Stanley is opposed to any interference on the part of the Mayor, City Manager or City Council. He is willing to have a new arbitration or to attempt to settle the wage dispute in direct negotiations with the union, but insists that he must refuse to accept an award which he considers has been made by a prejudiced board.

After the strike had been postponed out of a desire not to embarrass the city during the Republican convention, the City Council also had a resolution before it stating that "it is the opinion of the Council that the railway should accept the decree of the board of arbitration and grant the men the 12-cent-an-hour increase." This, however, was referred to the street railway committee of the Council, as was another resolution aimed to call a vote for the purchase of the Cleveland Railway by the city.

Another mass meeting of the union was held Wednesday night, June 11, at which the men were informed of the reasons for postponing the strike which they had voted. Sentiment at this meeting is said to have favored a move by the executive officers to put the strike into effect on June 14, but union officials say they are still trying to avert a walkout if it is at all possible.

## Wage Increase in Massachusetts Cities

### Trainmen in Springfield and Worcester Are Awarded Ten-Cent Advance Retroactive to Jan. 1

Wage increases of 10 cents an hour to uniformed and miscellaneous employees, with back pay on all payroll hours since Jan. 1, are granted the 2,000 employees of the Worcester Consolidated and Springfield Street Railway Companies in the arbitration award announced June 11. With it go an eight-hour day for uniformed employees, a spread of eleven hours for regular men and fourteen hours for spare men, and time and one-half for extra work. Louis C. Parker, chairman and neutral member of the arbitration board, personally appeared before the carmen in Springfield and explained the findings. Maximum pay is increased from 58 to 68 cents an hour.

The contract under this award will be dated Jan. 1 and will continue until June 1, 1925, although the new agreement and award will not be placed in operation until June 28. Back pay is at the rate of 10 cents for each hour worked in six months, to be computed on the basis of payroll hours of each employee and such payments to be made on or before Aug. 11.

Many of the so-called bonuses are reduced or entirely eliminated by the board, which expressed the opinion that "work required shall be paid for and that time paid for shall be worked and that there shall never be two payments to one man for the same work."

Employees had asked a maximum wage for uniformed men on two-man cars from $5.22 to $6.40 a day and were awarded a maximum rate of $5.44. They asked an increase from 8 to 15 cents an hour differential for one-man car operators, but were refused.

The uniformed men asked that where work on any run exceeded eight hours, compensation be thirty minutes for actual time up to fifteen minutes and one hour for the actual time between fifteen minutes and thirty minutes. The request was refused, and only actual time worked shall be paid for, with the proviso that not more than 30 per cent of the runs shall exceed eight hours. Eight hours pay is guaranteed spare men instead of seven hours as in the past.

Requests for ten minutes' pay for getting out cars and five minutes' for putting cars away were refused. One-man car operators were refused a request for five minutes to make changes at the end of the lines. Regular men will have only one unpaid relief each day, but spare men will have two reliefs, provided the reliefs are within eleven hours and that any relief of thirty minutes or less shall be paid platform time. Trackmen requested traveling time where work is more than 1 mile from the carhouse, but the request was refused. Traveling time is allowed where work is more than 2 miles, but this shall not be included as part of the day's work.

A separate department for the operation of buses, with seniority separate from that in the transportation service, is to be made, and vacancies are to be filled from the transportation department in the order of seniority if the men are qualified.

Attorney Bentley W. Warren, counsel for the company, presented a minority dissenting opinion. He said:

> The extravagant hourly rate fixed by my associates for motormen and conductors in Springfield and Worcester is unjustified and exhibits a reckless disregard of the rights of the public. The award is not justified on the basis of the cost of living.

The decision also affects the Milford, Attleboro and Woonsocket, Interstate Consolidated and Attleboro Branch Street Railway Companies. In relation to the different companies the report says:

> Evidence of the financial condition of the roads affected by this award was carefully considered. While, of course, wages must affect the finances of any company, yet the board does not think that its award of a fair and just wage in these cases will beyond reasonable doubt cause serious financial embarrassment to the companies, except in the case of the Milford, Attleboro & Woonsocket Street Railway. In considering that case a conference was held and by agreement between the men and the company an award was made of a wage rate, less than this board would otherwise think fair and just.

This award was not made public.

## Chicago Parleys Halt

### So Far as Surface Lines Are Concerned Purchase Negotiations Appear to Be at an End

The parleys between the Chicago Surface Lines and the officials of the city of Chicago have halted. On both sides it is now admitted that the municipalization of the lines seems no nearer than when the conferences started.

At the meeting previous to the ones that for a time at least terminated the negotiations, it appeared that a "working agreement" as to price had been reached. With the bankers insisting that they could not permit the repudiation of any part of the outstanding securities of the lines, because it would destroy all chance of marketing the Schwartz certificates, the various conferees apparently believed the Mayor had finally become convinced that he could not purchase the properties for less than $162,000,000.

Publication of the "working agreement," however, appears to have altered the Mayor's views, and at the last conference, he definitely declared that no agreement had been reached as to the price to be paid.

The Mayor was visibly disappointed. He would make no comment upon what the city proposed to do further in its effort to obtain the lines. Moreover, he announced that the bankers who have attended the conferences as representing the interests of the stockholders, admitted they had no legal authorization to speak for the security holders. The bankers, however, were of the opinion that this had been clear to the Mayor from the beginning. They gave it as their opinion that any recommendations they made to the security holders would be acceptable, and for this reason, they had felt justified in attending the conferences.

Meanwhile, similar negotiations with the Chicago Rapid Transit Company officials are proceeding with the purchase object in view. For more than an hour at the last conference Mayor Dever conferred with Samuel Insull, head of the company, and former Attorney-General Patrick J. Lucey, counsel for the system.

For rate-making purposes the elevated lines were valued by the Public Utilities Commission in 1921 at $86,250,000. Capital expenditure since then make the value as of Dec. 31, 1923, $90,499,756.

## I. C. C. Authority Involved

### Cases Before U. S. Supreme Court Involve Authority of Commission Over Certain Electric Lines

Arguments have been presented before the United States Supreme Court in consolidated cases involving the authority of the Interstate Commerce Commission to fix passenger fares on interurbans crossing state lines whose principal traffic is passenger rather than freight.

The cases are the appeals of the Interstate Commerce Commission and the Pennsylvania-Ohio Power & Light Company against the village of Hubbard, Ohio, and the Interstate Commerce Commission and the Steubenville, East Liverpool & Beaver Valley Traction Company against the city of Wellsville, Ohio. The issues are the same in each case and in both cases the district courts issued injunctions against the I. C. C. and the corporations against increasing intrastate passenger fares.

The Pennsylvania-Ohio company operates an interurban line between Youngstown, Ohio, and Sharon, Pa., about 14 miles, of which only about 1 mile is in Pennsylvania. Hubbard is half way between the terminals. The company sought to increase the fare from Hubbard to Youngstown in conformity with the fare from Hubbard to Sharon. The Interstate Commerce Commission granted it such authority, together with various other increases. The village of Hubbard resisted and won in the district court on the ground that the company did not operate as part of a general steam railroad and was not engaged in the general transportation of freight, thus being without the terms of the transportation act and outside the authority of the I. C. C. It was proved that the company operates a daily freight service and receives freight cars from steam railroads.

Similar issues are involved in the other case. The Steubenville, East Liverpool & Beaver Valley Company operates between Steubenville, Ohio, and Vanport, Pa., with various branch lines, the main line being 40.2 miles long, 11.4 miles in Pennsylvania and 28.8 miles in Ohio. In this case the city of Wellsville resisted the higher rates.

These cases form a test of that part of the transportation act giving the I. C. C. authority over interstate electric railways.

## Fifty Persons Injured in Double Accident in San Francisco

More than fifty persons were injured, many of them seriously, and four automobiles were badly damaged on June 2, when a crowded K line car of the Municipal Railway at San Francisco got beyond control in the Twin Peaks Tunnel. After a wild flight of eight blocks it crashed into an L line car at Dolores and Market Streets and caused the car with which it had collided to dash eight blocks down Market Street until it struck an automobile and stopped. The L car was discharging passengers at the time of the crash.

Witnesses said the K car was traveling 60 miles an hour when the crash occurred.

The accident was a most remarkable and unusual one in that a loaded car plunged at a speed variously estimated from 60 to 75 miles an hour down a grade as great as 5.4 per cent and that the car with which it collided in turn ran away for a distance of 2.9 miles. Still more remarkable, a considerable time elapsed after the rear-end collision before the brakes released on the second car and it in turn started on its wild trip of 0.6 mile down Market Street.

Fred Boeken, superintendent of the Municipal Railway, said shortly after the accident occurred:

> There are four devices by which our cars can be stopped and we do not understand why Cronin was unable to bring his car to a stop by any of these methods.
>
> First, there is the air brake. That evidently was faulty or completely out of order. Then there is the hand brake. A third way we have of stopping the car is by using the reverse lever. A fourth is a mechanical tripping device.
>
> In case both the hand brake and the air brake do not work a motorman can stop his car with the reverse lever. If the trolley is off the wire and he has no power with which to stop, there is the mechanical tripping device, which works independently of the other contrivances.
>
> Cronin has not explained to us satisfactorily why these four devices did not work. He says he used all four of them, but none would work. This would be so unusual as to be almost unbelievable. It is nothing unusual for trolleys to "run away," but they are always brought under control quickly and without the passengers knowing it by one or more of these four devices.

## Action Taken in New York Against Parking

Copies of the new police rules which prohibit automobile parking for more than twenty minutes on Broadway, Fifth Avenue and other main arteries of traffic in New York City, beginning June 10, were made public on June 6 by Police Commissioner Enright, following a conference with Dr. John A. Harriss, Deputy Police Commissioner, in charge of traffic, and Dominick Henry, deputy chief inspector, in charge of traffic regulation in all five boroughs.

The five streets on which parking will be prohibited are at the approaches of Williamsburg and Manhattan Bridges, respectively. At busy intervals those streets are clogged with traffic due largely to the parking of automobiles, and traffic policemen stationed at street intersections are powerless to keep them clear when parking is permitted.

Traffic policemen have been instructed to concentrate on a movement to keep the business streets clear of unnecessary congestion. Inspector Henry said that trucks backed up against the delivery entrances of houses in the wholesale district practically blocked the street, or at best left only enough roadway for a truck to pass through.

## Hearings on Maryland Company's Petition

The Maryland Public Service Commission has opened hearings on an application filed by the Washington, Baltimore & Annapolis Electric Railroad asking permission to increase its round trip and single fare rates 20 per cent and its commutation rates 10 per cent. The increase is designed to give the company additional revenue of $347,800, which is required, officials testified. The application for increase is being fought by many of the residents of the territory served by the company. E. J. D. Cross, assistant city solicitor, asked the commission to refuse to grant an increase until after a valuation of the company's property is made. Officials of the company declare the increase is necessary to enable the road to make certain additions and extensions.

## Committees Report Favorably on Acquisition of Chelsea Division

The Massachusetts Legislature has a favorable report from its street railway and Metropolitan affairs committees on a bill providing for the acquisition by the state and the leasing to the Boston Elevated Railway of the Chelsea division of the Eastern Massachusetts Street Railway.

Under the terms of the measure the Eastern Massachusetts will be paid $3,000,000 for the property, which is located in Boston, Revere, Chelsea, Malden and Everett. Of this amount $2,000,000 will eventually be paid by the Elevated and $1,000,000 by the cities benefited by the act through a sinking fund arrangement.

The proportion of the $1,000,000 to be borne by each city would be fixed at a conference of its representatives. The measure as drafted, which means increased and improved service along with a 10-cent fare, has the approval of the city of Boston and the railways.

## Fare Increase Granted in Suburban New York

Ten-cent fares on the lines of the Westchester Street Railroad, White Plains, N. Y., serving their territories were approved on June 5 by the Scarsdale and Harrison authorities, leaving the railway system of the county virtually intact. It was indicated later at the Court House that Supreme Court Justice Joseph Morschauser would vacate his peremptory order directing that service on these two lines be discontinued. With the exception of Mamaroneck, every municipality served by the road has heeded the court's order that it must allow an increase in fare to 10 cents in each zone and take the best service the company is able to offer, or lose all service. The fare has heretofore been 6 cents in each zone. The branch from the White Plains line to Mamaroneck will be shut off and the road sold at auction.

# Eight Cents Allowed

### Kingston Consolidated Permitted to Charge Increased Rate for One Year—Transfer Terms Unchanged

An order was issued on June 4 by the Public Service Commission permitting the Kingston Consolidated Railroad, Kingston, N. Y., to increase its cash or ticket fare to 8 cents. The order permits the change to be made on three days' notice, effective for one year and until further order of the commission. No change is made in the present regulation as to transfers, school or other reduced rate tickets.

The company claimed that its present rate of 7 cents cash, with sixteen tickets for $1, was insufficient to yield a reasonable return. It was contended that a 10-cent cash fare and 8-cent ticket fare should be permitted.

At a hearing of the interested parties held in Kingston on Jan. 23 two propositions were considered. The first was that the operation of the old Washington Avenue portion of the Colonial division be discontinued and that the system north of the power house be operated only during the five summer months. This would tend, it was claimed, to reduce the cost of service on the system.

The second proposition was to continue present service on the city division for the entire year, but to operate the Colonial division only during the five summer months. This plan, it was also claimed, would tend to reduce the cost of the entire service.

The city opposed any curtailment of service as well as any increase in fare.

The company has never paid a dividend on its common stock. Some 24 per cent in dividends remains unpaid on the preferred.

A valuation of $710,523 was claimed by the company. The commission, in its decision allows a valuation of $637,205.

The commission says the cost of service on the Colonial division is undoubtedly the cause of the unsatisfactory operating results.

Commissioner Van Namee says:

> The operating results of comparable companies of the state indicate that the operating expenses here are rather below the average. There was evidence that operating expenses will be increased approximately $2,000 in 1924 because of wage increases made in July, 1923. Taxes have increased approximately 28 per cent since 1920.
>
> The increases in fare during the period have not produced enough revenue to counteract the constant annual loss in revenue passengers. Such average decrease in revenue passengers has been about 200,000 a year. For the year 1924 it is reasonable to suppose that the number of revenue passengers will not be greater than 2,925,000.

The evidence showed that the railroad carried 3,127,573 revenue passengers in 1923; 3,229,133 in 1922; 3,456,423 in 1921, and 3,705,896 in 1920.

The memorandum continues:

> The rates demanded by the company—10 cents cash and 8 cents ticket—are plainly excessive. A flat cash fare of 8 cents will pay an estimated return of 7.8 per cent and such slight increase will not be likely further to diminish the number of revenue-paying passengers to any appreciable extent. This company must, however, practice the utmost economy, and should investigate the practicability of one-man safety car operation on its Kingston city division as a means of additional future retrenchment.

## Block Signal Systems Favored by Indiana Body

Failure of a train crew to obey a rule and the lack of a block signal system between Fort Wayne and Huntington, Ind., are blamed for the wreck on the line of the Indiana Service Corporation at Roanoke on May 19 by Samuel Artman, member of the Public Service Commission, who conducted a probe at Huntington. Five persons were killed and twenty injured when two passenger cars crashed head-on.

Mr. Artman held that the evidence showed a rule requiring extra trains to clear the main track five minutes before a regular train was due at a siding was violated by the crew of the eastbound extra passenger train. "The evidence is to the effect that this rule has been violated with more or less frequency and with some degree of consistency before the date of the wreck," Mr. Artman reported.

He said that, notwithstanding such violations, the management had taken no steps to secure strict compliance with the rule "beyond an occasional reprimand. The extent to which this failure to enforce the rule was responsible for the wreck is problematical, but that it was an indirect cause is a reasonable conclusion."

There is no block signal system between Huntington and Fort Wayne, the report says, and "the evidence is to the effect that if an automatic block signal system had been in operation upon the section on which the collision occurred the accident would almost certainly have been prevented."

Mr. Artman said he found the train records of the company "wholly unreliable," because instead of the dispatcher receiving actual reports upon the exact time a train passed a station, the dispatcher's assumption that the train passed on schedule time was recorded. On the day of the wreck numerous special trains were being operated and this may have been confusing to the dispatcher, the report says.

Mr. Artman makes five recommendations:

1. That the company immediately compel strict compliance with all rules.
2. That train records be based on actual information.
3. That additional stations be established where conductors get in direct communication with the dispatchers.
4. That the practice of operating so many extra trains be curtailed, but if they are necessary that such trains be operated as sections of regular trains.
5. That the commission "is thoroughly convinced" by the experience of the Roanoke wreck and the Alfont wreck on the line of the Union Traction Company on Feb. 2 that block signal systems are necessary, that the commission demands that the company ascertain the cost of a block signal system between Huntington and Fort Wayne and report to the commission within sixty days.

## Original Five-Cent Fare for District of Columbia Defeated

An effort on the part of Senator McKellar of Tennessee to compel the railways of the District of Columbia to return to their original charge for fares of 5 cents cash, with six tickets for 25 cents, was defeated in the Senate by a vote of forty-four to twenty-one. The Senator sought to attach his fare bill as an amendment to the District of Columbia appropriations bill.

The hearings on the bill before a Senate sub-committee covered the greater part of five months, but little interest was shown in the proposal by Senators, newspapers or the public.

During the hearings testimony was presented by George E. Hamilton, president, and John H. Hanna, vice-president and general manager of the Capital Traction Company, and W. F. Ham, president of the Washington Railway & Electric Company. These officials testified that a return to the old 5-cent fare, with six tickets for 25 cents, would mean ruin for the corporations. The present fare in the District of Columbia is 8 cents cash, with six tickets for 40 cents.

## Councilmanic Logic

MOTOR OMNIBUSES as an adjunct to municipal lines are the last word in efficient transit practice. The P. R. T. stands ready to make a widespread extension of this service by establishing four bus routes that will be of inestimable convenience to the people, relieve the pressure on the existing rail lines and afford a type of pleasure riding now available only to the wealthy. But it has been obstructed by the persistent demand for payment for the "privilege" of occupying the streets with the buses, from Councilmen and others who have not yet learned that state regulation of transit has radically altered conditions and that any charge piled upon the operator, over and above the ordinary taxes, is merely an addition to the burden which must be borne by the rider. The more onerous the franchise conditions the higher the fare.—Philadelphia *Public Ledger.*

## Council of Phoenix Acts to Carry Out Its Threat

Complaint has been filed with the clerk of the Superior Court at Phoenix, Ariz., seeking confirmation by decree of the court of action by the City Council in repealing Ordinance No. 123 and revoking the rights and privileges of the Phoenix Railway.

The complaint of the city sets forth that Ordinance No. 123 and all amendatory ordinances granting J. O. Dunbar, his successors and assigns a franchise to construct and operate an electric railway and a system of electric lighting adopted by the Common Council of Phoenix on July 28, 1892, have been repealed in an ordinance passed by the City Commission with an emergency clause.

The complaint prays for judgment to the effect that all the rights vested or purporting to be vested in the defendant be terminated by decree of the court by reason of the lack of authority of the Common Council to vest Dunbar or his successors and assigns with any right or rights more than a revocable license to use the streets.

The matter has been referred to previously in the ELECTRIC RAILWAY JOURNAL. The Phoenix Railway has never been a paying institution. In recent years under changed economic conditions the burden of paying for paving has become intolerable. The company has placed its side of the case squarely before the public.

## Detroit United Applies for Trucking Privilege

The Detroit United Railway Trucking Company has applied to the Michigan Public Utilities Commission for permission to establish a trucking line out of Imlay City. The trucking company is an adjunct of the Detroit United Railway system. The communities to be served are Brown City, Marlette, Elmer, Sandusky, Argyle, Ubly, Bad Axe and Harbor Beach. It is expected that through this application closer business relations with Detroit will be established for several of the Michigan Thumb district communities.

It is proposed to establish a daily freight and express service. The trucking company will not only carry freight originating in or destined to Detroit but will also handle shipments wholly between the trucking points.

## Talk of Rocky Mountain Electrification Revived

E. W. Beatty, president of the Canadian Pacific Railway, announced in Vancouver that serious thought was being given to electrification of the mountain division of that road. Experts are making a careful examination of the possibilities of such a change in the Rockies, and when their report is complete it will remain with the heads of the road to consider whether or not the cost would justify the change. He believes that electrification might greatly reduce the cost of haulage through the mountains and he made it clear that his road fully appreciated the steadily increasing westward flow of grain from Alberta to Vancouver and also the fact that the Canadian National in its more northerly pass through the mountains has very much easier gradients than the Canadian Pacific.

## Indiana Company Buys Buses

To augment its transportation service, the Interstate Public Service Company has placed an order with the White Company of Cleveland for eleven buses to be operated as an adjunct to the main line between Indianapolis and Louisville. The bus service, under present plans, however, will extend only as far south as Franklin, but later may be extended to Columbus according to a statement of Harry Reid, president.

The new buses, painted orange so as to harmonize with the color of Interstate passenger cars, will be of two designs. One will carry twenty-five passengers and the other twenty-six. They will be ready for delivery in about sixty days.

Mr. Reid said the purchase constituted the first active step of the Interstate company to meet bus line competition from Indianapolis. "If the people want to ride on rubber, we will provide that facility," he said. "The Interstate is in the transportation business."

## News Notes

**Fare Reduced Five Cents.**—The Yonkers Railroad has been authorized to charge 5 cents for a single-trip fare between Kimball Avenue, in the city of Yonkers, and Scotts Bridge over the New York, New Haven & Hartford Railroad track in the city of Mount Vernon. This rate is a reduction of 5 cents.

**Reduction in Wages Rejected.**—Employees of the Michigan Electric Railway, Jackson, Mich., have voted to reject a reduction of 2½ cents an hour in wages proposed by the company. The men are said to have instructed the advisory board, consisting of representatives of union locals in six principal cities, to consider the future course of action if negotiations now under way fail.

**Bus Service Wanted.**—Petitions requesting the Tampa Electric Company, Tampa, Fla., to establish bus service in the Seminole Heights, Idlewild and other sections are being circulated in these territories.

**Fare Cut to Meet Competition.**—In an effort to meet competition of the Trackless Transportation Company, which operates passenger buses along the Mississippi coast, the Gulfport & Mississippi Coast Traction Company, Gulfport, Miss., which operates between Biloxi and Pass Christian, for both passenger and freight traffic, has reduced passenger fares from 7 to 5 cents from zone to zone. This makes the trip between Biloxi and Gulfport 25 cents instead of 35 cents.

**New Rates Sanctioned.**—The Public Service Commission has approved a new tariff filed by the New York & Long Island Traction Company which establishes a new system of fare zones. For a continuous ride from one business center to another between the following named villages the fare will be 5 cents: Mineola and Hempstead, Hempstead and Roosevelt, Roosevelt and Freeport, Freeport and Baldwin, Baldwin and Rockville Center, Rockville Center and Lynbrook, Lynbrook and Valley Stream, Valley Stream and Rosedale. This change was referred to in the ELECTRIC RAILWAY JOURNAL, issue of May 31.

**Wants to Operate Buses.**—The Rock Island Southern Railway has filed application with the Illinois Commerce Commission for permission to operate a bus system from Silvis to Galesburg through East Moline, Moline, Rock Island, Taylor Ridge, Reynolds, Matherville, Gilchrist, Aledo, Monmouth and Cameron.

**Paving Provision Rescinded in New Grant.**—The Council of St. Mary's, Ohio, has granted a twenty-year extension of the Western Ohio Railroad franchise for the operation of cars there. Freedom from street-paving assessments is a provision of the new franchise, which differs from the one now in effect. The relief granted has little value at present, as 2 miles of street traversed by the railroad through town is already paved except one block. Western Ohio bondholders are said to be trying to refinance the road on condition that street paving obligations be eliminated. Ordinances identical with that adopted at St. Mary's are being placed before Councils in other towns served by the Western Ohio Railroad.

**Fares Advanced.**—City fares on the line of the Stark Electric Railroad in Alliance, Ohio, were increased to 6 cents on June 8. This 1-cent advance was projected to meet a deficit of nearly $1,000 a month in the city accounts. This action was also taken to retain service over part of the city line for which the company had filed an application to abandon. The abandonment plan was sidetracked for the present.

**Wages to Be the Same.**—Trainmen of the Pennsylvania-Ohio Power & Light Company, including the Youngstown Municipal Railway, will receive the same wages during the next year as this year. This was announced on June 4, after the men had voted favorably on a proposal submitted by the company. The wage scale is as follows, according to the term of service of the employee: First three months, 48 cents an hour; second nine months, 51 cents, and after one year service, 57 cents, with 5 cents an hour additional on one-man cars.

**Bus Route Pamphlet Ready.**—A folder showing the routes of the bus lines operated by the Los Angeles Railway and by the Los Angeles Motorbus Company, Los Angeles, Cal., has been compiled and will be mailed on request.

**Long Distance Bus Line Proposed.**—A long distance bus line is contemplated by the Eastern Massachusetts Street Railway. It is to run between Boston and Lowell, through Cambridge, Arlington, Winchester, Woburn, Burlington and Billerica, with a fare of $1. If the experiment is successful the service will be extended to other parts of the system. Three buses of the Fageol type, each having a capacity of twenty-two passengers, will be used. Communities through which the buses will pass are believed to be favorably disposed toward the plan, though the precise route that the buses should take through some of the towns is a matter of controversy. The State Department of Public Utilities will pass on the question of public necessity and convenience of the proposed service.

**Half Cent Increase on July 1.**—The Cincinnati Traction Company, Cincinnati, Ohio, has announced that the rate of fare on all its lines will be increased one-half cent on July 1. The cash fare will be 10 cents, with a reduction of one-half cent if tickets are purchased. At the present time the cash fare is 9 cents. This will be the highest rate of fare that so far has been charged under the existing law, which became operative in October, 1918. The increase is based upon the report of receipts and expenditures of the traction company for April and May, which indicate that the gross returns from fares and other sources did not offset the cost of operation. For a time, it was believed the negotiations for the proposed new franchise under which the Cincinnati Street Railway is to resume operation of the system would be concluded in sufficient time to make the increase unnecessary, but it was announced that even if the ordinance were passed it would be subject to a thirty-day referendum period and consequently it could not prevent the proposed increase on July 1.

**Amended Subway Proposal Rejected.**—Acting on the recommendation of Arthur S. Tuttle, chief engineer of the Board of Estimate of New York City, that body on June 9 disapproved the State Transit Commission's latest amended plans for the section of the Brooklyn-Eastern District subway east of Montrose Avenue and sent them back to the commission for revision. This further delay is not expected to interfere with the contemplated opening on July 15 next of that part of the Fourteenth Street-Eastern line virtually completed, extending through Fourteenth Street, Manhattan, and into Brooklyn as far as Montrose Avenue.

**Hearing on Injunction Application Scheduled.**—Hearing on an application for a permanent injunction to restrain the United Railways & Electric Company, Baltimore, from charging 8 cents cash fare and 7½ cents when tokens are purchased, which rate was recently authorized by the commission, will be opened before Judge Charles F. Stein, in the Circuit Court on June 17. The application for the injunction was filed by Mayor Howard W. Jackson, acting as a taxpayer of the city, and also by the Mayor and the City Council. The United Railways and the Maryland Public Service Commission are named as defendants.

**Bus Franchise Granted.**—The City Council of Philadelphia on June 5 passed an ordinance granting to the Philadelphia Rural Transit Company a franchise for five bus lines. There were seventeen votes for the bill. On the day previous the Council's committee on public safety approved a bill providing for a $50 license fee for buses after a provision requiring taxicabs to pay a $5 fee had been stricken from the bill. This measure will probably be passed by Council the latter part of this month. Under the provisions of the bill the Philadelphia Rural Transit Company would pay an annual fee of $50 on each of the 200 or more buses operated on the five new bus routes.

**New Company will Operate Interurban.**—The Winona Service Company, Winona, Ind., has been incorporated with 10,000 shares of stock, no par value, to operate the line formerly known as the Winona Interurban Railway. This property was recently bought at a receiver's sale for $309,369 by James P. Goodrich, formerly Governor of Indiana. The sale was referred to in the ELECTRIC RAILWAY JOURNAL, issue of June 7. Authority to issue $600,000 of 6 per cent serial bonds is asked in a petition filed with the Indiana Public Service Commission by the Winona Service Company. The proceeds of the bond issue would be used to finance service improvements. Another petition asks authority to sell the company's electric generating equipment to the Interstate Public Service Company and to buy current from the Interstate.

# Foreign News

*From the Journal's Own Correspondents*

## Extensions to Paris Metropolitan Lines Progressing

The work of construction and extension of the underground lines of the Paris Transports en Commun, begun in 1920, has been carried out actively through 1923. There have been added to the length of line operated another 7½ km., which brings the total up to 92 km. out of a proposed total of 122 km.

Consent is now being obtained for an additional line to follow the grand boulevards through the heart of Paris. The city of Paris itself will undertake the construction and to this end will seek a public loan. A project has been investigated for extending the lines out into the suburbs at surface level or on an elevated structure with a further project of running certain urban trains out into the country over the tracks of the steam railroads, thus avoiding changes and congestion of railway station traffic at rush hours.

In 1923 passengers carried increased to 468,845,000 from 451,781,000 in 1922, receipts increasing from 154,507,000 francs to 160,786,000 francs respectively. It is anticipated that the receipts for 1924 will be appreciably greater by reason of the 20 per cent increase in fares which has been in effect since the middle of January of the present year.

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## Trackless Trolley Versus Tramway at Darlington

The tramway tracks in Darlington (England) belonging to the municipality are badly in need of renewal, and in view of the cost involved the question has been discussed locally whether it would not be more economical to abandon the tramways and to substitute the trackless trolley system. The tramways are not very extensive, measuring in all about 9 miles, reckoned as single track, and they have not been very successful financially.

The Town Council of Darlington recently obtained a report from Alfred Baker, general manager Birmingham Corporation Tramways, on the subject of replacing the Darlington trolley lines with trackless trolleys. Mr. Baker, who has had the experience of converting one of the Birmingham tramway routes to the trackless car system, estimates the cost of reconstructing the 9 miles of Darlington tramways, including the doubling of some of the single track, at £94,000, and the cost of installing the trackless system instead, including £27,000 for eighteen trolley buses at £34,000. Among advantages of trackless trolley lines pointed out by the report, as compared with gas buses, are comfort for the passengers, electric motive power, the silence of the vehicle, and good acceleration and retardation. The receipts on the trolley buses are estimated at 14.5d. per mile run, or on an annual mileage of 450,000, £27,187, while the working expenses are put at 11d. per mile run, or £20,625 per annum. From the gross surplus of £6,562 would have to be deducted £4,166 for interest and sinking fund on the capital expenditure and for depreciation and renewals, leaving a net profit of £2,396.

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## New Cars for London Tube Railways

The London underground railway companies have placed contracts for the construction of 127 additional cars for service on the Edgware & City & South London lines as follows: Metropolitan Carriage, Wagon & Finance Company, fifty-two motor cars; Birmingham Railway Carriage & Wagon Company, fifty trail cars; Cammell, Laird & Company, twenty-five control trail cars. This new rolling stock will be of the same type as now running in daily service from Moorgate and Hendon and Highgate. It will bring the total number of cars of this design to 318.

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## Improvements on Madrid Tramways

During the past year various improvements have been carried out in the street car system of Madrid, the Spanish capital. One narrow-gage line has been brought up to standard gage, 5 ft. 8¼ in. The length of line under operation is now 93 km. and several extensions are under construction or projected. All the old rolling stock is about to be rebuilt so that the cars can be operated either open or closed according to the seasons, which are very variable indeed. The company also purchased fifty new cars last year.

During the past year, operation was attended with some difficulty as all current was purchased. A new central station has now been constructed and will in future serve the street car system exclusively.

Receipts for the six months ending Dec. 31 last were 10,863,422 pesetas (normal par 19.3 cents), which was an increase of 741,019 pesetas over the same period in 1922.

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**Bradford to Retain Tramways.**—A proposal that the trackless trolley system should supersede the tramways in Bradford on twenty-four routes when the tracks are worn out has been rejected by the City Council, but it agreed to a scheme to make use of railless trolley buses for an extension of an existing tramway route. The council has had several years' experience of the working of trackless cars. Some time ago R. H. Wilkinson, the general manager, estimated that by the adoption of railless cars on the whole tramway system there would be a saving of about £41,000 a year as compared with the cost of renewal and operation of the tramways. F. O. Whiteley, the city treasurer, contended that the saving would be much less, and pointed out that the maintenance of railless cars would cost more than that of tramway cars, and the latter could carry more passengers. He also showed that though permanent way renewals would be eliminated, road tax would have to be paid.

**Railway Competition in Glasgow.**—The steam railway companies, with both elevated and underground lines in Glasgow, are now endeavoring to compete for local traffic with the municipal electric tramways. This effort takes the form of cheap fare facilities, particularly weekly zone tickets.

**Power Plant for East Tokio.**—The department of railways of Tokio announces the building of an electric generating plant on the Shinana River to cost $23,000,000. This plant is to furnish power for distribution over all the east-central portion of Japan feeding the electrical service of Tokio and also supplying power for the Tokio Railway.

**Another Pass in England.**—The tramways committee of the Hull Corporation Tramways, Hull, England, has announced the adoption of the weekly pass in connection with its zone fares. The charge for the pass for a given 1½d. (3-cent) zone will be 2 shillings (48 cents normal exchange) and for a 2d. (4-cent) double-zone, 2/6 (60 cents normal exchange), thus making the weekly prices equivalent to 16 and 15 standard fares respectively. Hull, with a population of 300,000, is practically the same size as Bradford, the pioneer British user of the unlimited-ride weekly pass.

**A New Ticket Machine.**—The London underground railway companies are experimenting with a new type of ticket-issuing machine. This is on the principle of the "Rolltic" machine and is designed to hold a roll of 5,000 tickets, 347 yards long. The present machines hold only 500-750 tickets. During rush traffic it is imperative that there should be no pause in the issue of tickets and with a roll of tickets capable of supplying 5,000 passengers the machine will run for a number of hours before the ticket supply needs replenishing. Further improvements are to be made by the provision of electrical devices which will enable the passenger to obtain his ticket by inserting the correct fare in the slot, thus relieving him of the necessity of having to push buttons or pull levers.

**Developing a London Underground Station.**—There will shortly be ready a new station of the City & South London Railway, constructed under the roadway at Moorgate in the City of London. The new booking hall will measure 3,575 sq.ft., compared with 1,175 sq.ft. in the old station, constructed twenty-four years ago. The passenger lifts are being taken out and two escalators substituted. The journey from booking hall to station platforms will occupy seventy-five seconds. The escalators will have a capacity of 10,000 passengers an hour.

# Financial and Corporate

## New Yorkers Ride at Less Than Cost

### B.-M. T. Chairman Says Earnings on Company's Investment Average 3.83 per Cent Over Ten-Year Period

Gerhard M. Dahl, chairman of the executive committee of the Brooklyn-Manhattan Transit Corporation, says riders in New York have failed to pay the cost of carrying them for the last ten years to the extent of $84,968,800. The taxpayer and investor have paid the deficit. He says the subway problem in New York will never be solved until the public faces the cold, hard facts, which are financial and not political. As for his company, Mr. Dahl says that it can work out the situation on a 5-cent fare so far as its own selfish interests are concerned, but that it cannot possibly expand and develop and give the kind of service to which the community is entitled unless the taxpayer is willing to pay the difference between 5 cents and the actual cost to carry the car rider.

In support of the statement that car riders in the past ten years have been getting for 5 cents a ride that costs 7.31 cents, data are adduced showing annual return yielded by actual earnings on the average investment of the past ten years by the company and by the company and city combined. Actual expenditures of the company under contract No. 4 with the city to June 30, 1923, totaled $86,000,000, while expenditures of the city were $149,700,000. The investor's ten years' experience with rapid transit as set down by Mr. Dahl follows:

| Year | Average Investment | Required Earnings for 6 per Cent Return | Actual Earnings | Equivalent to Per Cent per Annum | Required Fare per Passenger for Required Earnings |
|---|---|---|---|---|---|
| 1914 | $64,104,364 | $3,846,261.86 | $2,975,759 | 4.64 | $0.055 |
| 1915 | 81,978,103 | 4,918,686.19 | 3,265,275 | 3.98 | .060 |
| 1916 | 94,439,363 | 5,666,361.79 | 3,924,467 | 4.15 | .059 |
| 1917 | 102,969,130 | 6,178,147.80 | 4,358,451 | 4.25 | .058 |
| 1918 | 112,331,758 | 6,739,905.47 | 4,760,451 | 4.23 | .058 |
| 1919 | 117,848,569 | 7,070,914.12 | 4,331,680 | 3.67 | .059 |
| 1920 | 123,304,531 | 7,398,271.84 | 3,542,008 | 2.87 | .060 |
| 1921 | 130,148,642 | 7,808,918.55 | 1,414,177 | 1.08 | .066 |
| 1922 | 136,982,390 | 8,218,943.41 | 6,640,557 | 4.84 | .054 |
| *1923 | 142,270,833 | 8,536,250.00 | 7,264,324 | 5.10 | .053 |
| Average for ten-year period | $110,637,768 | $6,638,266.10 | $4,247,715 | 3.83 | .0579 |

*1923 partly estimated.

The company's investment as just indicated includes existing rapid transit lines at time dual contracts were made; in the contracts they were considered to have an earning capacity of $3,500,000 a year, and this amount has been capitalized at 6 per cent. Results of operation show, instead of 6 per cent earned on its investment, varying percentages constituting an average of 3.83 per cent. The average required earnings to produce a 6 per cent return would have been $6,638,266, whereas average actual earnings for ten years were $4,247,715.

The average investment of company and city combined, together with return yielded by actual earnings, and the required fare per passenger to cover interest on city's investment and 6 per cent return on company's investment is stated by Mr. Dahl as follows:

| Year | Average Investment | Required Earnings for Actual Interest on City Investment and 6 per Cent Return on Company Investment | Actual Earnings | Equivalent to per Cent per Annum | Required Fare per Passenger for Required Earnings |
|---|---|---|---|---|---|
| 1914 | $111,311,681.87 | $5,530,070.63 | $2,975,759 | 2.67 | $0.065 |
| 1915 | 136,254,719.41 | 7,393,639.87 | 3,265,275 | 2.40 | .075 |
| 1916 | 164,334,880.91 | 8,465,743.54 | 3,924,467 | 2.39 | .073 |
| 1917 | 191,311,355.26 | 9,661,106.64 | 4,358,451 | 2.28 | .074 |
| 1918 | 219,385,684.23 | 11,150,387.45 | 4,760,451 | 2.17 | .075 |
| 1919 | 239,580,315.07 | 12,084,990.88 | 4,331,680 | 1.80 | .075 |
| 1920 | 256,815,616.52 | 13,048,756.41 | 3,542,008 | 1.38 | .075 |
| 1921 | 270,990,290.24 | 14,044,938.89 | 1,414,177 | .52 | .081 |
| 1922 | 282,299,595.16 | 14,681,821.73 | 6,640,557 | 2.36 | .068 |
| *1923 | 289,751,631.06 | 16,278,991.88 | 7,264,324 | 2.50 | .069 |
| Average for 10-year period | $216,203,576.97 | $11,234,044.79 | $4,247,715 | 1.96 | .0731 |

*1923 partly estimated.

As just indicated the average return for the 10-year period was 1.96 per cent. The average cost of carrying passengers was 7.31 cents, indicating 2.31 cents has been paid by the taxpayer and the investor.

Mr. Dahl has reiterated these facts on several public occasions recently. They are all contained in a pamphlet "The Car Rider, the Taxpayer and the Investor," published recently.

## Toledo and Indiana Railway Purchased and Reorganized

The Toledo & Indiana Railway, which operates between Toledo and Bryan, has been purchased by Cincinnati and Toledo, Ohio, interests. Those interested in the transaction are: L. G. Van Ness, president of the Cincinnati, Lawrenceburg & Aurora Electric Street Railroad and the Cincinnati, Georgetown & Portsmouth Street Railway; Charles Dehore, railway specialist of the General Electric Company, L. E. Eastman, Toledo attorney, and M. M. Miller, president of the Home Bank & Trust Company, Toledo. The railway property includes 52 miles of right-of way between Toledo and Bryan.

The Toledo & Indiana Railway was organized in 1905 to operate an interurban line between Toledo and Fort Wayne, Ind. Because of financial difficulties the company extended only from Toledo to Bryan. At the outbreak of the world war the company had under consideration plans and financial support to extend the line to Fort Wayne, but construction of this line was abandoned.

The purchase transaction involves about $1,000,000. The Toledo & Indiana Railway was incorporated with a capital of $1,040,000. In acquiring control of the company the Cincinnati and Toledo interests purchased the stock. The Central Light & Power Company and the Wauseon Light & Power Company, subsidiaries of the Toledo & Indiana Railway, also have been taken over by Mr. Van Ness and his associates.

The Toledo & Indiana Railway has been reorganized with Mr. Van Ness as president; Mr. Dehore, vice-president; Mr. Eastman, secretary, and Mr. Miller, treasurer.

Under the new arrangement the Central Light & Power Company and the Wauseon Light & Power Company will be consolidated under the name of the Lake Shore Light & Power Company and a separate company will be made of the Toledo & Indiana Railway, although the officers will be the same as those of the interurban company. The current will be generated by the railway company and distributed by the Lake Shore Light & Power Company to a dozen small municipalities which are located in the northwestern part of the state.

## Willoughby Property Has Deficit in 1923

The Cleveland, Painesville & Eastern Railroad, Willoughby, Ohio, reports gross earnings for 1923 amounting to $631,346. For 1922 the gross earnings were $663,344. Total expenses showed an increase from $443,477 in 1922 to $455,816 in 1923. Net earnings decreased $41,858. After the consideration of various income charges, including interest on bonds and other miscellaneous charges, the net income for the year ended 1923 showed a deficit of $28,074 against a surplus, in 1922, of $3,541.

The statement of gross earnings, by years, beginning with 1902 and ending with 1923 showed a decided growth in the company business during that time. In 1902 the gross earnings totaled $189,187, showing a steady increase up to 1921 when the earnings were $701,-

026. In 1922 they went down to $663,344 and last year $631,346. During the year ended Dec. 31, 1923 $10,328 was expended on additions and improvements chargeable to capital account.

## Chicago "L" Stock Offered Direct

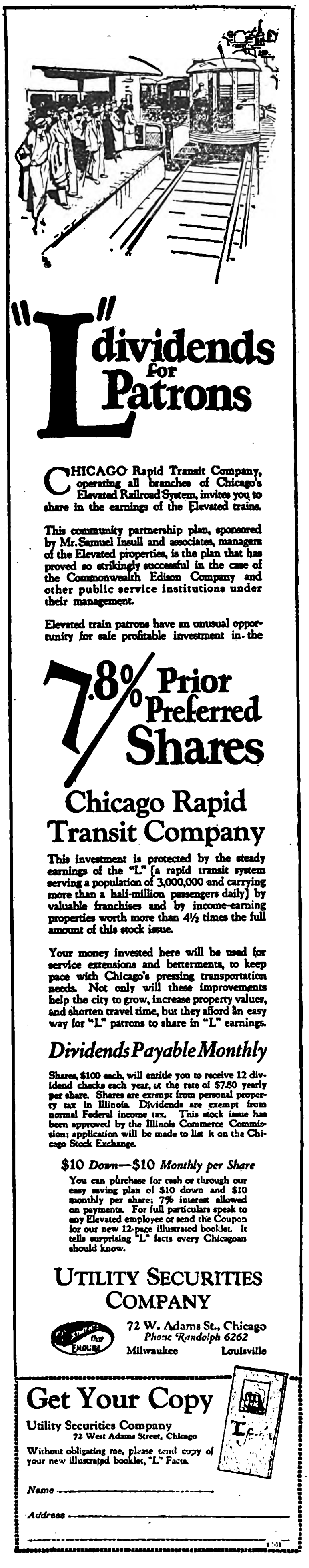
### Sale of New Issue to Public Started June 7—Employees Oversubscribed Their Allotment of $1,000,000

In accordance with previously announced plans, the new prior preferred stock of the Chicago Rapid Transit Company, which was sold to the employees on favorable terms up to the opening of the public sale, was offered to the public at par, beginning on June 7. On that date two-column advertisements were inserted in all the local newspapers, similar to the one reproduced in the accompanying engraving. At the same time, Samuel Insull, chairman of the board of directors of the company, issued a statement in which he said:

> The plan of offering stock to customers is the same that has been followed locally by the Commonwealth Edison Company, the Peoples Gas Light & Coke Company and the Public Service Company of Northern Illinois. It provides an opportunity for safe investment, gives the community a real financial interest in the success of the company and affords an additional incentive for still greater service. Out of the proceeds of the $5,000,000 series "A" prior preferred stock, about $3,000,000 will be used for important improvements necessary to keep pace with Chicago's growing demand for transportation. The rest will be used for refunding indebtedness. Additional cars that can be used for subway as well as elevated lines will be purchased, and main line platforms will be lengthened so as to permit six and eight car train operation. This latter is expected to give 15 to 20 per cent more capacity through the loop.
>
> The company considers the prior preferred stock an excellent investment. The shares are exempt from personal property tax in Illinois and exempt from the normal federal income tax and are preferred as to dividends over interest on the adjustment debenture bonds, as well as preferred both as to dividends and assets over the preferred and common stock. The company will not entertain any propositions for the sale of the properties to the city of Chicago which does not fully protect this issue.
>
> The properties of the Rapid Transit Company were valued in 1921 by the Public Utilities Commission at $86,250,000, which with additions and betterments to Dec. 31, 1923, of $2,266,359 and other corporate properties of $1,983,397 valued on the same basis as the commission valuation make a total appraisal of $90,499,756. To this figure should be added the improvements to be made through the sale of preferred stock. The Chicago Rapid Transit Company lines in 1923 carried 203,954,574 passengers, an increase over 1922 of 12½ per cent. All employees have been delegated to take subscriptions to the prior preferred stock investment.

On the basis of the incomplete returns on June 6 it was announced that the employees of the company had largely oversubscribed the amount of new prior preferred stock of the company which was set aside for them.

As announced in the ELECTRIC RAILWAY JOURNAL for May 31, page 871, the new issue of 7.8 per cent prior preferred stock issued by the "L" lines consists of a total of $5,000,000, of which $1,000,000 was set aside for employees. It was assumed that this amount would be ample to fill the demands of employees for the new stock. However, in a campaign lasting only two weeks, very close to 11,500 shares were purchased. This represents a total value exceeding by $150,000 the amount set aside for employee subscriptions. Of a total of 5,860 employees more than 75 per cent subscribed for the new stock.



"L" dividends for Patrons

CHICAGO Rapid Transit Company, operating all branches of Chicago's Elevated Railroad System, invites you to share in the earnings of the Elevated trains.

This community partnership plan, sponsored by Mr. Samuel Insull and associates, managers of the Elevated properties, is the plan that has proved so strikingly successful in the case of the Commonwealth Edison Company and other public service institutions under their management.

Elevated train patrons have an unusual opportunity for safe profitable investment in the

7.8% Prior Preferred Shares

Chicago Rapid Transit Company

This investment is protected by the steady earnings of the "L" [a rapid transit system serving a population of 3,000,000 and carrying more than a half-million passengers daily] by valuable franchises and by income-earning properties worth more than 4½ times the full amount of this stock issue.

Your money invested here will be used for service extensions and betterments, to keep pace with Chicago's pressing transportation needs. Not only will these improvements help the city to grow, increase property values, and shorten travel time, but they afford an easy way for "L" patrons to share in "L" earnings.

*Dividends Payable Monthly*

Shares, $100 each, will entitle you to receive 12 dividend checks each year, at the rate of $7.80 yearly per share. Shares are exempt from personal property tax in Illinois. Dividends are exempt from normal Federal income tax. This stock issue has been approved by the Illinois Commerce Commission; application will be made to list it on the Chicago Stock Exchange.

$10 *Down*—$10 *Monthly per Share*

You can purchase for cash or through our easy saving plan of $10 down and $10 monthly per share; 7% interest allowed on payments. For full particulars speak to any Elevated employee or send the Coupon for our new 12-page illustrated booklet. It tells surprising "L" facts every Chicagoan should know.

UTILITY SECURITIES COMPANY

72 W. Adams St., Chicago
*Phone Randolph 6262*
Milwaukee Louisville

Get Your Copy

Utility Securities Company
72 West Adams Street, Chicago

Without obligating me, please send copy of your new illustrated booklet, "L" Facts.

*Name* ------------------------------

*Address* ------------------------------

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Many interesting phases of the sale have developed as a result of comparisons of statistics available. In a number of cases individual trainmen purchased from twenty-five to thirty shares of the stock and paid for it in cash. Although there was a deferred payment option in connection with the purchase of the stock, approximately 2,650 shares of the total of 11,500 shares sold were paid in cash. This amounts to approximately 23 per cent of the total number of subscriptions. The total of 11,500 shares was taken by approximately 4,500 subscribers, making an average of a little more than 2½ shares per subscription.

## New York Railways Reports Falling Off in Traffic

The New York Railways, operating 72 miles of line in New York City, which is expected to lift its receivership by July 1, the end of the company's fiscal year, recently submitted its report on operation for the nine months ended March 31. The figures include those of the leased lines of the company. The year ended March 31, 1924, showed a net improvement of $29,459, although there was a falling off in Manhattan in surface car traffic when compared with the traffic for the nine-month period ended March 31, 1923. The company reports total operating revenue of $6,733,977, compared with $6,971,610 for the same period in 1923.

Gross revenues from passengers were $6,129,283 for the nine months, compared with $6,311,150 in the corresponding period a year ago. Total operating expenses were $5,989,655, against $6,173,405. Taxes were $608,515, against $656,772. Net income from railway operations prior to fixed charges on securities outstanding and rentals, and prior to income from any bank balances and investments, was $135,806, compared to $141,433, a decrease for the period of $5,627.

Non-operating income was $449,269, against $469,184. Total fixed charges, including interest, rents and other deductions amounted to $2,080,186, as shown in the corporation's and receiver's reports, against $2,135,187 in the same period of last year, leaving the net corporate deficit in the combined reports at $1,495,110, against $1,524,570.

Considerable interest attaches to the progress of the New York Railways System, with the end of the receivership imminent which was instituted in 1919. Under the guidance of Job E. Hedges, the receiver, the various groups of bondholders have come to terms on a policy of readjustment.

The decrease in traffic on the lines of the system is shown by the fact that in the nine months ended March 31 total revenue passengers numbered 118,871,216, as compared with 122,074,837 in the previous similar period; paid 2-cent transfers collected totaled 8,357,499, against 9,529,662; free transfers collected totaled 2,260,687, against

2,886,618, and revenue car-miles operated totaled 8,831,992, against 8,994,558.

Under the plan which was submitted to the bondholders' committee last February, the capitalization of the new company will be in the neighborhood of $40,000,000.

The company's funded debt is $58,173,027. The accumulated deficit for the estate, resulting from interest accruals, amounts to $15,708,318, and the accumulated deficit for the receiver since he took over the properties, $1,213,701.

## Seeks Partial Abandonment in Palo Alto

Importance of serving the public interest was emphasized by Commissioner Martin at a hearing in Palo Alto, May 13, on the application of the Peninsular Railway to abandon franchises and tracks and all local service in that portion of the city of Palo Alto, Calif., to the north of the Southern Pacific tracks. With this major object in view Commissioner Martin continued the application of the railway company until June 10, largely for the purpose of giving the railway and city officials an opportunity for further negotiation, and if possible, agreement, which will enable the railway to continue to operate car service. He suggested the propriety of either the city or the company arranging for motor bus service.

It was brought out by the applicant at the hearing that due to passage of an ordinance by the city trustees of Palo Alto, requiring certain street improvements, the company desired to abandon all local service, but proposes to continue to operate the service between the Southern Pacific station and the campus of Stanford University. The company claims that the operations in the city of Palo Alto are carried on at a substantial loss, but that there is some profit in the operations between Palo Alto and Stanford University.

## Dividend Declared on Manhattan "L" Issue

The board of directors of the Interborough Rapid Transit Company, New York, on June 10 directed the payment on July 1, 1924, of the rental of the Manhattan Elevated Railway for the quarter ended June 30 next at the rate of 4 per cent per annum upon the stock of the Manhattan company. This payment is based on the earnings of the previous quarter in accordance with the requirements of the readjustment agreement of 1922.

On July 1, 1923, the rental was not paid in full at the 3 per cent rate agreed upon for last year because estimates made at the time indicated that it would not be earned to the extent of 15 cents a share of stock. The exact earnings now having been ascertained to have been at the 3 per cent rate, the board of directors directed payment on July 1 next of this amount in addition to the regular quarterly rental previously mentioned, thus making a total of $1.15 a share of Manhattan stock.

On Jan. 1, 1924, the rental for the quarter then just ended was deferred because the earnings for the quarter ended Sept. 30, 1923, showed a deficit and an estimate for the remainder of the year did not seem to warrant the belief that the year would show earnings at the rate of 4 per cent. The directors decided in view of the increase in taxes and contingent liabilities, it is more prudent to await the ascertainment of the exact facts as to the earnings for the year ending June 30 next than to base any action upon estimates at this time.

Definite action on the matter will be taken, however, in ample time to permit the payment on Oct. 1, next, of the deferred quarter's rental or such part as may be found to have been actually earned in case the earnings for the year shall not equal 4 per cent upon the Manhattan stock.

The earnings of the subway and elevated combined for the month of April showed a balance of $461,163, but the earnings for the ten months ended April 30 last showed a deficit of $370,917, with the Manhattan rental accrued for that period at the rate of 4 per cent. The figures for May are not yet available.

## $6,500,000 of Chicago Rapid Transit Bonds Offered

The Chicago Rapid Transit Company offered through the National City Company and Halsey Stuart & Company, New York, on June 11, $6,500,000 of 6½ per cent first and refunding mortgage gold bonds of the series due in 1944. The offering price was 94½ and interest to yield more than 7 per cent. The first and refunding mortgage bonds will be secured by a first mortgage on the property of the so-called South Side Division. The bankers say that the earning power of this division has been notably consistent. The earnings and expenses of the properties comprising the South Side Division covering a period of six years follows:

| | Average for 5 Years Ended Dec. 31, 1918-22 | Year Ended Dec. 31, 1923 |
|---|---|---|
| Gross earnings | $4,366,383 | $4,952,168 |
| Operating expenses, current maintenance, taxes, rental and equipment charges, and pro rata share of charges for Loop Terminal operation | 3,217,415 | 3,723,249 |
| Balance applicable to interest charges and reserves | $1,148,968 | $1,228,919 |
| Annual interest on first and refunding mortgage bonds, including this issue, requires ..... | ......... | $518,500 |

The bankers say that the combined properties of the Chicago Rapid Transit Company for the twelve months ended March 31, 1924, produced gross earnings of $18,554,781 and net earnings of $3,874,235. Annual interest on divisional mortgage bonds and equipment obligations outstanding with the public and first and refunding mortgage bonds, including this issue, requires $2,344,000, indicating a balance available for replacements, junior securities, etc., of $1,530,235.

## Losses Increase

The Jamestown Street Railway, Jamestown, N. Y., shows an increase in its net corporate loss for the first quarter of 1924 against a similar period a year ago. The loss from January-March, 1923, was $16 and in 1924 it was $13,628. The Chautauqua Traction Company also showed an increase in the net loss, being $28,790 in 1923 and $34,918 for the period from January-March, 1924. The net corporate loss of the Jamestown, Westfield & Northwestern was $6,805 for the first quarter in 1923 against $13,072 for a similar period in the current year. The three companies operate in Chautauqua County, New York, and are controlled by the same interests.

**Mayor Has Municipal Railway Appropriation Measure.**—A resolution asking the Board of Estimate of New York City to authorize the issuance of $50,000 in special revenue bonds to replenish the revolving fund for the operation by the city of the Staten Island Midland Railway was passed by the Board of Aldermen on May 27. It is now in the hands of the Mayor pending his approval or veto. The resolution was passed on the recommendation of Commissioner Grover A. Whalen of the Department of Plant and Structures. Mr. Whalen's suggestions with respect to the needs of the Staten Island line were reviewed at length in the ELECTRIC RAILWAY JOURNAL for May 24, page 830.

**Bonds Approved.**—The State Railroad and Public Utilities Commission recently issued an order approving the application of the Tennessee Electric Power Company for the issuance of $1,000,000, fifteen-year 6½ per cent debenture bonds, due 1939. The bonds are to be sold at not less than 92 cents on the dollar plus interest. The proceeds are to be used for certain improvements made in the power plants and in the Nashville Railway & Light Company's property.

**Take Over "L" Line.**—An agreement has been entered into between the Boston Elevated Railway and the Middlesex & Boston Street Railway under which the Elevated turns over its tracks in Trepelo road in Belmont to the Middlesex & Boston, which is to perform all the service there in the future. The line which the Middlesex & Boston takes over runs from the railroad crossing at the Waverly station of the Boston & Maine Railroad to the Belmont-Waltham line. The agreement has just received the approval of the State Department of Public Utilities.

**Another Move Made in Montreal Suit.**—As a sequel to the recent suit wherein the Montreal Tramways & Power Company, Montreal, Que., seeks $4,000,000 as loss of profit and damages from certain of its former directors, and the Imperial Trust Company, Ltd., another action has been taken by C. H. Cahan, for the Tramway & Power Company, asking the court to declare void a note for $824,603 signed by E. A. Robert in favor of the Imperial Trust Company. The note in question was signed by Mr. Robert before he ceased to be president of the Montreal Tramways & Power Company, and when he was still head of the Imperial Trust Company, Ltd. By it, the Tramway & Power Concern was bound in a sum of $824,603 and this transaction is numbered among those which the present directorate attacks in its suit to recover $4,000,000 from Mr. Robert and other former directors of the plaintiff company, and from the Imperial Trust Company, Ltd.

**Accumulated Deficit $1,682,874.**—The Visalia Electric Railroad, operating in Visalia, Exeter-Strathmore and vicinity, reports to the California Railroad Commission for the year 1923 that its operating revenue was $206,573 and operating expenses $133,051, giving a net operating revenue of $73,521. The net corporate loss for the year was $114,680. The deficit at the beginning of the year was $1,568,501. Miscellaneous additions to surplus for 1923 amounted to $307, leaving an accumulated deficit at the end of the year of $1,682,874.

**Notes Issued.** — A bonded indebtedness of $2,500,000 has been created by the Key System Securities Company, a holding company for the Key System Transit Company, Oakland, Cal. The indebtedness takes the form of 6 per cent notes, dated July 1, 1925, and maturing in ten years. They are secured by a collateral trust agreement on property held by the company.

**Long-Term Bond Issue Offered.** — Offering of an issue of Wheeling Public Service Company consolidated first mortgage 6 per cent gold bonds due Oct. 1, 1952, is being made by H. M. Jacoby & Company and Glidden, Morris & Company, New York, at 77, to yield 8.10 per cent. The company operates 25.7 miles of electric railway at Wheeling, formerly comprising the properties of the Wheeling & Elm Grove division of the West Virginia Traction & Electric Company. It is explained that the company's water property has been sold to the city of Wheeling and a contract signed to take it over on Sept. 1, 1924, which will bring $225,000 to the company's treasury. Negotiations are also under way to sell Wheeling Park and other real estate, conservatively estimated in value at $300,000.

**Dividend Payment Cut by Twin City Company.**—The Twin City Rapid Transit Company, Minneapolis, Minn., has declared a semi-annual dividend of 2 per cent on its outstanding common stock. From 1910 until April 1, 1918, the company paid 1½ per cent quarterly. On April 1, 1918, the quarterly dividend was reduced to 1 per cent. The dividend was passed in July, 1918. A dividend of 1 per cent was paid in January, 1919, and 2½ per cent on Feb. 20, 1920, 3 per cent was paid on Jan. 3, 1921, 2 per cent Feb. 10, July 1, and Dec. 30, 1922, and 3 per cent July 2, 1923, and 3 per cent Dec. 21, 1923.

**Line Discontinued.** — The Selectmen of Pembroke, Kingston and Hanson, Mass., have been notified of the discontinuance of about 8 miles of track operated by the Brockton & Plymouth Street Railway between Mayflower and Kingston carhouse. The entire road is 26 miles long. The discontinued trackage is in the middle of the system. The two ends will be operated as separate units.

**Preferred Stock Offered.**—W. C. Langley & Company, New York, are offering 5,000 shares of the 7 per cent cumulative preferred stock of the Knoxville Power & Light Company, Knoxville, Tenn., at $98 a share and accrued dividend, yielding about 7.14 per cent. The company conducts the electric power and light and street railway business in Knoxville, and surrounding territory. It operates under the supervision of the Electric Bond & Share Company.

**Seeks to Abandon.**—The Connecticut Company, New Haven, Conn., has petitioned the Public Utilities Commission for permission to discontinue operation over the tracks of the New York, New Haven & Hartford Railroad between East Hartford and Rockville. The company will claim that the service is not paying and that it is a duplication.

**$1,581,000 Issue Sought by Boston Elevated.**—The Boston Elevated Railway has petitioned the Massachusetts Department of Public Utilities for permission to issue $1,581,000 of thirty-year 6 per cent bonds to refund a similar amount of West End Street Railway bonds on Aug. 1.

**Stock Offering Successful.**—The Tennessee Electric Power Company, Chattanooga, Tenn., operating among other properties 70 miles of electric railway, announces that more than $700,000 of its first preferred stock has been sold to its customers and employees in less than six months. The company had two reasons for offering the stock, the first being to obtain money for capital expenditures and the second for the furtherance of the customer-ownership idea.

**Gold Bonds Offered.**—Harris Forbes & Company, New York, N. Y., are offering at 96¾ and interest yielding about 5.75 per cent $20,000,000 of the Puget Sound Power & Light Company's first and refunding mortgage 5½ per cent gold bonds, Series "A". The bonds are dated June 2, 1924, and are due June 1, 1949. The company does the greater part of the commercial light and power business in western Washington and substantially all the electric street and interurban railway business in this district except in Seattle.

**Line Abandoned.** — The Wyoming Public Service Commission has granted the Sheridan Electric Railway permission to abandon its line between Sheridan and the Veteran's Hospital No. 6, formerly known as Fort McKenzie.

**Line Bought.**—The 4-mile trolley between Phoenixville, Pa., and Spring City, known as the Chester & Montgomery Street Railway, has been bought by Thomas O'Connell of Phoenixville from the American Gas Company, for $10,000, with twenty years to pay.

# Book Reviews

### Portland Cement Prices

Their basis, character and present position. By Henry Parker Willis, Professor of Banking, Columbia University, and John R. B. Byers, Instructor in Economics, College of the City of New York. The Ronald Press, New York, 1924. $1.25.

That uniformity of prices is a quality indicating competition rather than combination in trade is the principal theme of this book, written by two well-known economists. This investigation was undertaken at the request of some of the leading producers of portland cement in the eastern part of the United States, because the manufacturers felt that the actual facts with regard to the economic conditions of manufacture should be made public. The authors, however, assume sole responsibility for the statements in the book.

An interesting story is told of the method by which the price of portland cement is determined and the factors which affect it in any given market. The way in which competition tends to fix a uniform price is convincingly brought out. Figures are presented to show that at the present time the average return to the producer of cement after making a fair allowance for depreciation is in the neighborhood of 7 per cent.

Among the reasons mentioned for the general uniformity in prices of portland cement are the fact that it is a uniform standardized product conforming to recognized tests of quality; that it is produced under substantially uniform conditions of manufacture, without trade secrets or patent processes which might be relied upon to furnish an advantage to one concern; that it is subject to very sharp competition on the part of buyers, who are, for the most part, professionally informed as to changes in cost and who are influenced by the price of cement as a constituent element in commodities or services which they are undertaking to deliver, and that it is in a high degree subject to the so-called law of substitution, by which is meant that for many purposes a substitute of some sort can be found in other materials.

No technical description is given of the composition and qualities of various kinds of cement, but the reasons why prices tend to be uniform in any one market are set forth. This book is therefore likely to be of interest and value to any one concerned with the purchase of large quantities of portland cement.

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### Car Lighting by Electricity

By Charles W. T. Stuart, Foreman of Car Lighting, Philadelphia Terminal, Pennsylvania Railroad. Published by Simmons-Boardman Publishing Company, New York, 1923.

This book is a practical treatise on the construction, operation, inspection and maintenance of the car lighting systems in use on American railway cars. The various systems in use are described in some detail, and methods of installation are included.

# Personal Items

## N. H. Brown Leaves the Railway Field

N. H. Brown, general manager of the Stark Electric Railroad, Alliance, Ohio, has resigned to become associated with A. L. Chambers & Company, investment bankers, Buffalo, N. Y. This firm has been desirous of having Mr. Brown associated with it for some time, but on account of several important problems of the Stark Electric, he wished to remain until these were in process of completion. Mr. Brown retires from the street railway field after more than thirty years of service. He started as a conductor and worked through the various departments. He has been identified with the New York State Railways, Syracuse, N. Y.; Worcester Consolidated Street Railway, Worcester, Mass.; Albany Southern Railroad, Albany, N. Y.; International Railway, Buffalo, N. Y.; New Orleans Railway & Light Company, New Orleans, La.; Buffalo & Lackawanna Traction Company and the Depew & Lancaster Railway Corporation, both of Buffalo, N. Y., and the Stark Electric Railroad of Alliance, Ohio.

**Charles Dehore** will assume active management of the reorganized Toledo & Indiana Railway, Toledo, Ohio. Mr. Dehore is a railway specialist of the General Electric Company and is also secretary of the Cincinnati, Georgetown & Portsmouth Street Railway.

**Howard W. Palmer**, for many years a member of the editorial staff of the Watertown, N. Y., *Daily Times*, commenced duty as assistant secretary to the New York Public Service Commission June 2. Mr. Palmer will assist the secretary in the preparation of news reports of hearings and decisions of the commission.

**W. S. Lee** has been appointed general carhouse foreman for the Charleston Consolidated Railway & Lighting Company, Charleston, S. C. In this capacity he succeeds Ernest Barker, master mechanic, resigned. Mr. Lee has been in the employ of the company since January, 1911, when he entered the service as a trainman. Later in that year he was transferred to the car shop and on Dec. 1, 1921, became carhouse foreman, which position he held until his recent promotion to general carhouse foreman.

**Glenn S. Reeves** has been appointed assistant master mechanic of the Omaha & Council Bluffs Street Railway, Omaha, Neb., to take the place made vacant by the death of O. A. Norene. The electric railway industry is not entirely a new line of endeavor for Mr. Reeves, as he was employed in the shops of the Omaha & Council Bluffs Street Railway for several summers while still carrying on his studies at the University of Nebraska. As assistant master mechanic of the property he will report directly to T. E. Wood, master mechanic.

**Charles E. Bostwick, Jr.**, for six years superintendent of the Jacksonville Traction Company, Jacksonville, Fla., has become manager of the White Star Stage Line at Tampa, organized recently to take over bus properties reported to have been purchased by Stone & Webster. The stage company operates from Tampa to Orlando, St. Petersburg and other important points in that section of Florida. Mr. Bostwick was graduated from Georgia Tech.

**George R. Brown** has been appointed purchasing agent of the Des Moines City Railway, Des Moines, Iowa.

# Obituary

## Henry Sellers McKee

Henry Sellers McKee, a pioneer Pittsburgh and New York capitalist, died on June 10 following an operation. He was eighty-four years old. Mr. McKee was prominent for more than half a century in glass making and was nationally active in the electrification of street railways. From 1890 to 1902 Mr. McKee was interested in a syndicate which accounted for the electrifying of traction systems in Pittsburgh, Buffalo, Indianapolis, Rochester, Newark and Paterson. The McKee group won a signal victory before the United States Supreme Court when local capital in Indianapolis attempted to take over the street railway franchise there. Philander C. Knox and ex-President Benjamin Harrison represented the McKee interests. In his early work in the electric railway field Mr. McKee was associated with Murry A. Verner in acquiring the Pittsburgh & Birmingham Traction Company and other properties. Among his other contemporaries in the traction field in Pittsburgh in the early days of electric traction were George W. Elkins, P. A. B. Widener and C. L. Magee.

**Davis J. Cable**, president of the Lima Street Railway and of the Lima-Toledo Railroad, Lima, Ohio, died on May 18, following an illness of six months. One of Lima's foremost lawyers and financiers, Mr. Cable was in close touch with the public and actively interested in the various public utilities in the city and vicinity. He was attorney and one of the promoters of the Fort Wayne, Van Wert & Lima Traction Company, Fort Wayne, Ind. He was also attorney for the Lima Street Railway prior to the organization of the Ohio Electric Railway and was attorney for the northern district of the Lima-Toledo Railroad for many years, becoming president in 1922, when the organization of the Lima Street Railway and Lima-Toledo Railroad took place. His son, Congressman John L. Cable, who had been associated with him, will continue as counsel for the public utilities with which they have been associated for years.

**Joseph O. Gauthier**, superintendent of rolling stock and shops of the Middlesex & Boston Street Railway, Waltham, Mass., died recently at the Newton Hospital, at the age of fifty-six, after an illness of some six weeks. Mr. Gauthier entered the railway business in 1891 as a night inspector with the Middlesex & Boston Street Railway. He worked his way up to the position of superintendent of equipment. Mr. Gauthier was held in high esteem both by the management and his employees and was known quite well throughout New England. At the time of his twenty-fifth anniversary in the employ of the company he was presented with a Waltham watch and $25 in gold from the directors of the company at a reception held in his honor.

**O. A. Norene** formerly assistant master mechanic of the Omaha & Council Bluffs Street Railway, Omaha, Neb., died recently.

**Frank Lewis Buxton**, for thirty-four years with the Boston Elevated Railway and for much of that time at the Park Street station, died recently while en route to Boston from Amherst, Mass., where he had a summer home. He had the distinction of being the first man to drive an electric car in the Newtons. He was born in Haverhill, Mass., in 1860.

**J. Walter Tracy**, vice-president and general manager of the North East Electric Company, Rochester, N. Y., was drowned in Lake Ontario on May 30 while attempting the rescue of members of a cruising party swept overboard in very rough water. Mr. Tracy entered the automotive field in October, 1912, with the North East Electric Company, makers of starting, lighting and ignition systems, horns and speedometers for buses and other automotive equipment. A pioneer in automotive electrical service, he developed and built up a service organization for North East equipment along original lines, and when the North East service organization was incorporated as a separate concern in 1921 he was made the active head.

**William Crawford Smith**, for many years superintendent of the New Castle division of the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, is dead. Mr. Smith was seventy-seven years old. He had retired from the railway business early in 1922 following a career of forty-two years. From 1880 to 1883 he conveyed passengers for the Citizens' Passenger Railway of Pittsburgh and in 1883 became stable chief and superintendent of the East End Division. In 1889 he was appointed assistant superintendent of the Citizens' Traction Company. His experience also included the direction of cable cars. When the Pittsburgh companies were consolidated Mr. Smith was made superintendent of transportation. From 1901 to 1904 he acted as assistant manager and later general manager of the Mahoning Valley Street Railway in Youngstown, but returned for three years to Pittsburgh. From 1907 and up to the time of his resignation he was with the Mahoning & Shenango Railway & Light Company in Youngstown as superintendent with headquarters at Newcastle.

# Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

## Use of Wood Preservative Is Increasing

Between 6,000,000 and 8,000,000 wood cross-ties are said to be used annually by the electric railways of the country. Of the number installed in 1922, according to statistics compiled by the United States Forest Service, only 600,000 were treated with wood preservative before being placed in the ground. Separate figures are not available for 1923 to show how many treated ties were installed by the electric railways and how many by steam railroads. The total number of treated ties used in that year, however, was considerably greater than during the preceding year, and it may reasonably be inferred that the electric railways used a proportionately larger number.

There seems to exist in some quarters a misapprehension concerning the life of untreated wood ties in paved streets, which may partly account for the comparatively small use of treated ties by the electric railways. While it may be said in general that ties last longer in paved streets, where they are protected from the weather, than they do in open track construction, according to the American Wood Preservers' Association, drainage is really the controlling factor. In some cases ties on unpaved streets have lasted several years longer than those in paved streets in the vicinity.

There can be no question but that with steadily rising timber prices electric railways must devote more attention to the use of wood preservatives not only for ties but also for other purposes. The committee on wood preservation of the American Railway Engineering Association has stated that the use of treated ties of one kind or another is not only an economic necessity but an economic duty for all railways. In other words, none but treated ties should be used, irrespective of climate or other condition, except where there may be still available naturally long-lived woods. If the steam railroads can save from 10 cents to 20 cents per tie per year by the use of a preservative treatment there can be no question but that the electric railways would secure equally good results.

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## Japan Orders Railway Equipment

A contract calling for $1,500,000 of railway electrification equipment was received on June 12 by the Westinghouse Electric International Company from Takata & Company, acting as agents for the Imperial Government Railways of Japan. The contract covers equipment for the extension of electrical service in the vicinity of Tokio.

Included in the order are eight large locomotives for high-speed express service which will eventually extend from Tokio to Kobe, ten 2,000-kw., 1,500-volt rotary converters, two 2,000-kw. motor-generator sets, with automatic switching equipment, and a large amount of substation equipment.

In a statement made just after the order was received I. F. Baker, manager of the Westinghouse Electric International Company in Japan, who is now in New York on a commercial visit, said: "This order is the result of several years study with the Imperial Government Railways, during which a careful comparison was made between Westinghouse equipment and that of important European competing companies and is an indication of the excellence of American-designed electrical apparatus."

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## Infringement of Fageol Patents

A letter has been sent by Fageol Motors Company, Oakland, Cal., to all bus body manufacturers in the United States drawing attention to the subject of infringing patents. The company declares that it feels sure none of the other manufacturers would knowingly commit any infringement of the Fageol patents. Several, however, have inquired what features are covered by these patents so that they might be guided thereby in designing their own bus bodies. With a view to answering those questions, therefore, the company has distributed the letter and a folder describing certain features of the Fageol construction.

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## New Sales Organization for Central and Northwestern States

James C. Jameson and Harry E. Ross have organized the Jameson-Ross Company with offices in the Straus Building, 310 South Michigan Avenue, Chicago, Ill. This company will act as sales agents in the Central and Northwestern States for manufacturers of railway supplies and equipment. Among others it will represent the Dayton Mechanical Tie Company, Dayton, Ohio; Indianapolis Switch & Frog Company, Springfield, Ohio; Railway Track Work Company, Philadelphia, Pa.; Atlas Railway Supply Company, Chicago; Liteweld Company, Cleveland, Ohio; Electric Tamper & Equipment Company, Chicago; Plymouth Bus Body Works, Plymouth, Ind., and the Universal Lubricating Company, Cleveland, Ohio.

Mr. Jameson has been identified with the electric railway industry for more than fifteen years. He is vice-president and secretary of the Indianapolis Switch & Frog Company and is also vice-president of the Dayton Mechanical Tie Company. Mr. Ross recently resigned as Western manager for ELECTRIC RAILWAY JOURNAL and *Bus Transportation* to take up this new work. He was formerly secretary of the Kenfield-Davis Publishing Company and business manager for *Electric Traction.*

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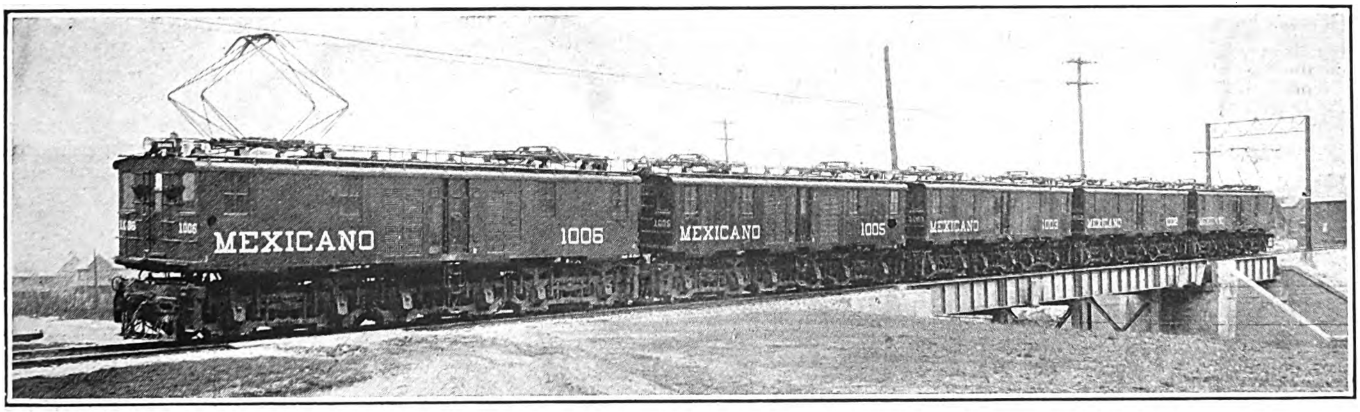
## Metal, Coal and Material Prices

| **Metals—New York** | June 10, 1924 |
|---|---|
| Copper, electrolytic, cents per lb. | 12.687 |
| Copper wire base, cents per lb. | 15.25 |
| Lead, cents per lb. | 7.05 |
| Zinc, cents per lb. | 6.17 |
| Tin, Straits, cents per lb. | 42.00 |
| **Bituminous Coal, f.o.b. Mines** | |
| Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons | $4.425 |
| Somerset mine run, Boston, net tons | 2.175 |
| Pittsburgh mine run, Pittsburgh, net tons. | 1.875 |
| Franklin, Ill., screenings, Chicago, net tons | 2.00 |
| Central, Ill., screenings, Chicago, net tons. | 1.625 |
| Kansas screenings, Kansas City, net tons.. | 2.50 |
| **Materials** | |
| Rubber-covered wire, N. Y., No. 14, per 1,000 ft. | $6.35 |
| Weatherproof wire base, N.Y., cents per lb. | 17.25 |
| Cement, Chicago net prices, without bags. | $2.20 |
| Linseed oil (5-bbl. lots) N. Y., per gal. | $0.97 |
| White lead, in oil (100-lb. keg), N. Y., cents per lb., carload lots. | 12.25 |
| Turpentine, (bbl. lots), N. Y., per gal. | $0.85 |



**Five of the Ten Locomotives Recently Built by the General Electric Company for Heavy Duty in Mexico. They Are Here Shown on the Test Tracks at the Erie Plant of the General Electric Company**

## *Rolling Stock*

**Pacific Electric Railway, Los Angeles, Cal.,** has announced specifications on the 1,350 freight cars referred to in the ELECTRIC RAILWAY JOURNAL, issue of April 5, 1924. The order included 600 drop bottom gondolas, 150 steel flat and 600 wood box cars. The detailed specifications follow:

| | |
|---|---|
| Number of cars ordered | 600 |
| Date order was placed | Dec. 26, 1923 |
| Date of delivery | March 26, 1924 |
| Builder of car body | Standard Steel Car Co. |
| Type of car | 50-ton single sheath box |
| Total weight | 43,200 lb. |
| Bolster centers, length | 30 ft. 8 in. |
| Length over all | 45 ft. 1¼ in. |
| Truck wheelbase | 5 ft. 6 in. |
| Width over all | 10 ft. 6 in. |
| Height, rail to trolley base | 14 ft. ⅛ in. |
| Body | Wood |
| Roof: | 300 Murphy radial all-steel.<br>300 Hutchings car roofing. |
| Air brakes | N. Y. Air Brake |
| Axles | Pollak steel, A.R.A., 5½ in. x 10 in. |
| Bearings | E. S. Woods, side bearings |
| Couplers, | A.R.A. type D National Malleable Castings Company |
| Hand brakes, | National Malleable Castings Company |
| Journal bearings, | Friction 5½ in. x 10 in. A.R.A. Mangus Company |
| Journal boxes | Bettendorf |
| Springs | Railway Steel Spring Company |
| Trucks | Bettendorf |
| Wheels | 33-in. C.I., 750-lb., A.R.A. |

| | |
|---|---|
| Number of cars ordered | 150 |
| Date order was placed | Dec. 26, 1923 |
| Date of delivery | March 15, 1924 |
| Builder of car body, | Ralston Steel Car Company |
| Type of car | 50-ton steel, flat |
| Total weight | 33,688 lb. |
| Bolster centers, length | 30 ft. 8 in. |
| Length over all | 41 ft. 9⅜ in. |
| Truck wheelbase | 5 ft. 6 in. |
| Width over all | 9 ft. 9½ in. |
| Body | Steel |
| Air brakes | Westinghouse KC-812 |
| Axles, | Pollak steel, A.R.A. standard, 5½ in. x 10 in. |
| Center and side bearings | E. S. Woods |
| Couplers, | A.R.A. type D, National Malleable Castings Company |
| Hand brakes, | National Malleable Castings Company |
| Journal bearings, | Friction, 5½ in. x 10 in., Mangus Company |
| Journal boxes, | American Steel Foundry, integral |
| Springs | Railway Steel Spring Company |
| Trucks | American Steel Foundry, integral |
| Wheels | 33-in. C.I., 750-lb., A.R.A. |

| | |
|---|---|
| Number of cars ordered | 600 |
| Date order was placed | Dec. 26, 1923 |
| Date of delivery | March 26, 1924 |
| Builder of car body, | General American Car Company |
| Type of car | 50-ton drop bottom, gondola |
| Total weight | 46,775 lb. |
| Bolster centers, length | 31 ft. 10½ in. |
| Length over all | 46 ft. 1½ in. |
| Truck wheelbase | 5 ft. 6 in. |
| Width over all | 10 ft. 5⅝ in. |
| Height | 9 ft. 7⅞ in. |
| Body | All-steel |
| Air brakes | Westinghouse KC-812 |
| Axles, | 5½ in. x 10 in., A.R.A., Pollak Steel Company |
| Bearings | E. S. Woods, side bearings |
| Couplers, | A.R.A. type D, National Malleable Castings Company |
| Hand brakes, | National Malleable Castings Company |
| Journal bearings, | 5½ in. x 10 in. friction A.R.A. |
| Journal boxes | Integral type |
| Springs | Railway Steel Spring Company |
| Trucks, | American Steel Foundry, integral type |
| Wheels | 33-in. C.I., 750-lb., A.R.A. |

**Indianapolis Street Railway, Indianapolis, Ind.,** expects to receive and place in service ten new cars during the course of the next few weeks. These are double-truck, closed passenger cars of the Peter Witt type, 50 ft. in length over bumpers. They will be equipped with Taylor trucks, 24-in. steel wheels, four G. E. No. 258 motors per car, one G. E. 12 H controller, G. E. air compressor and Peter Smith heater. It is expected that more cars of the same type will be ordered in the near future.

**Twin City Rapid Transit Company Minneapolis, Minn.,** upon the determination of a permanent rate of fare in the Twin Cities, plans a five-year program providing for the expenditure of $3,000,000 for new "noiseless" type cars to be installed at the rate of fifty a year.

**Buffalo & Lake Erie Traction Company, Buffalo, N. Y.,** to be succeeded under reorganization by the Interurban Company, will, it is reported, purchase twenty-five new cars for use in interurban service modeled after the design of the one-man interurban cars in use on the lines of the Kentucky Traction & Terminal Company, Lexington, Ky.

**Interstate Public Service Company, Indianapolis, Ind.,** has placed an order with the White Company of Cleveland for eleven buses. The buses will be of two designs. One will carry twenty-five passengers and the other twenty-six. They will be ready for delivery in about sixty days.

## *Track and Line*

**San Francisco Municipal Railways, San Francisco, Cal.,** will probably build an extension into the Eureka Valley district following a recommendation adopted by the public utilities committee of the Board of Supervisors.

**Tri-City Railway, Rock Island, Ill.,** through Manager T. C. Roderick, announced that the relaying of tracks on the Third Avenue line along Seventh Street, Rock Island, would cost $13,000.

**Pittsburgh Railways, Pittsburgh, Pa.,** following a paving agreement with the city of McKeesport, will carry out some improvement plans. The work includes the placing of girder rails in Fifth Avenue between the bridge and B. & O. tracks and necessary paving, at a cost of $33,180. One track is to be renewed in Fifth Avenue between Sinclair and Huey Streets and new track is to be laid in Fifth Avenue between Huey and Evans Streets and paving done, at a cost of $46,522. If the company has sufficient funds Atlantic Avenue is to be improved, probably not later than 1926.

**Seattle Municipal Railway, Seattle. Wash.,** is being urged by the residents of the University District to extend the Cowen Park line on Fifteenth Avenue Northeast across the park north to Bothell Way.

## *Power Houses, Shops and Buildings*

**Columbus Railway, Light & Power Company, Columbus, Ohio,** plans a one and three story, 52 x 125-ft. reinforced-concrete addition to its power house on Gay Street. The contract for erection has been awarded to E. Spencer, 910 Huntington Bank Building, for $125,000.

**Toledo, Fostoria & Findlay Railway, Fostoria, Ohio,** has completed an automatic substation, replacing the steam plant which had been in service more than twenty years. The main plant handles power for cars between Findlay and Pemberville.

**Pacific Electric Railway, Los Angeles, Cal.,** plans to build a concrete substation near Twenty-fifth Street and Long Beach Avenue at a cost of more than $60,000.

**Steubenville, East Liverpool & Beaver Valley Traction Company, East Liverpool, Ohio,** plans new substations at Steubenville, Costonia, Yellow Creek, Kountz Corner, East Liverpool, Industry and near the Pennsylvania-Ohio state line for conversion of 22,000-volt a.c. to 635-volt d.c. at a cost of $175,000.

## *Trade Notes*

**General Electric Company, Schenectady, N. Y.,** has recently opened a service shop in Kansas City, provided with machine equipment of new and up-to-date design. In addition to the service shop at Kansas City, service shops have been established within a year in Los Angeles, Seattle and Dallas.

**King's Concrete Crosstie Corporation, New York City, N. Y.,** has been incorporated to manufacture patented and unpatented railroad crossties and tie plates. The capital is $1,000.

**Pharo Engineering Company, Pittsburgh, Pa.,** has been appointed sales representative of the Nichols-Lintern Company, Cleveland, Ohio. It will handle the entire line of Nichols-Lintern specialties for electric railways and industrial plants.

**Okonite Company, Passaic, N. J.,** announces that George N. Brown has been appointed manager of the Atlanta office, succeeding J. L. Phillips, who has been appointed manager of the San Francisco office.

## *New Advertising Literature*

**Jewell Electrical Instrument Company, Chicago, Ill.,** has started the publication of a house organ called the "Jewell Magnet." The paper will be issued because the company feels that electrical measuring instruments are the "keystone of the electrical industry." The company invites suggestions and constructive criticism from every one in regard to articles for scientific or strictly electrical engineering data.

**Electric Machinery Manufacturing Company, Minneapolis, Minn.,** has issued Bulletin No. 833, on "E-M Junior Synchronous Motors for Direct Connection to Small Compressors."

**Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.,** has issued "Westinghouse Mica Insulation," dealing with all the forms of sheet, hot molding and cold molding mica insulation manufactured by that company. The booklet, a 16-page publication known as folder 4531-A, describes the various grades of mica insulation and gives their different applications.

**Crouse-Hinds Company, Syracuse, N. Y.,** has issued folder No. 11, entitled "100 per Cent Fireproof Interlocking Safety Switch and Plugs."

New York, June 21, 1924

# Electric Railway Journal

*Consolidation of Street Railway Journal and Electric Railway Review*

Published by McGraw-Hill Company, Inc.

Henry W. Blake and Harry L. Brown, *Editors*

*Volume 63*
*Number 25*

## Making Office Furniture Pay Big Dividends

ELSEWHERE in this issue, Robert M. O'Brien, superintendent of rolling stock and shops New Orleans Public Service, Inc., tells how that company in 3½ years has increased the average car mileage per pull-in from 1,380 to 217,728. An interesting statement in this account is that with an idea of building up the morale of the mechanical department, master mechanics at the various carhouses were provided with suitable offices and office equipment. Of course, it is not claimed that this was the reason that the number of pull-ins and the maintenance cost were reduced. But it indicated a line of thought on the part of the management that probably goes a long way toward explaining the remarkable record which the mechanical department has made.

A good man always works better when an appeal is made to his self-respect. Giving the master mechanics better offices and better office furniture did not make them any more capable in a technical sense, but it undoubtedly did give them a new sense of their own importance in the railway organization and stimulated them to do better work than they had ever done before. Many a man has it in him to do good work if properly encouraged. In this case the encouragement took the form of increasing the dignity of the position, and certainly if the results achieved at New Orleans are a fair criterion, this method is worth trying elsewhere.

## Using a Technical Man for Technical Work

ANOTHER progressive step that the New Orleans company has taken to improve the quality of railway maintenance work is the employment of young graduate engineers to inspect and test electrical apparatus. The superintendent of rolling stock and shops believes that a man who has made a comprehensive study under competent instructors of the theoretical side of electricity, is better able to make accurate scientific tests, than is the average practical railway man.

For this reason it is planned to have the electrical equipment of the cars thoroughly overhauled after 40,000 miles of operation, and carefully tested by an electrical engineer before it is returned to service. Should the engineer in his work of testing find only one serious defect in equipment that would have caused an accident should it have passed a less rigid inspection, his salary would be earned several times over. Even without this contingency, the reliability of the equipment should eliminate delays and interruptions to service that in themselves cost a great deal of money.

This is in line with the best modern thought on the subject of technical education, which acknowledges that the college graduate, after having a certain amount of practical experience is usually far more valuable in any organization than is the man without technical training. It is, however, a point of view which has been slow to be accepted by electric railway men in general, and the adoption of this plan by New Orleans Public Service, Inc., is the more encouraging on that account.

## He Bought Them Because They Were Cheap

A MAN we know has a pile of old hats on the shelf of the hall closet in his home. There are straw hats, felt hats, and derbys; some broken, others out of shape and all rather dilapidated. None of them is much good to him now although in every case he thought himself rather smart when he bought the hat. He bought them because they were cheap.

Afterward, he discovered that while the cheap hat looked well enough at first, it did not last very long. So he got another cheap hat to replace the first cheap hat, and in the end spent a good deal more money than if he had bought a high-grade product in the first place.

A few railways follow a similar policy in buying rolling stock. They purchase second-hand cars and equipment because they are cheap. Later they find out, as did the man with the hats, that cheapness alone is not a sufficient recommendation. Their odd cars differ in appearance and mechanism from the other cars on the property. They give to the property an appearance that we like only to associate with the junk yard. The variation in equipment requires extra investments to provide replacement parts and thereby adds to the overhead expense. Maintenance costs run high and increase rapidly as time goes on. The number of pull-ins and service interruptions are disgraceful. And soon the cars have to be scrapped—much sooner than new cars would have had to be scrapped.

A company which follows this policy, soon accumulates a miscellaneous assortment of rolling stock which clutters up the storage yards and is the only thing it has to show for money spent, for such cars would doubtless earn deficits. Like the old hats of the man already referred to, these cars are of little value. Bought because they were cheap, they gave a poor quality of service and had only a brief useful life. A first-class car bought new would have given more and better service and in the long run would have been a decided economy as well as an attraction to riders.

There are occasions when the purchase of a few second-hand cars will successfully solve a pressing problem. As a regular policy, however, it is almost certain to be a failure. Yet it is nice for the managements who are living in 1924 and not 1904 to have this other type of management in existence, because this provides a means of disposing of the "has beens" in cars.

**This is the issue in June that is devoted essentially to maintenance subjects**

## A New Way of Increasing Rail Life

WITH improvements in track joints the wear of the rail head is becoming more and more a dominant factor in the life of track. Wear depends primarily on the hardness of the rail, and the high carbon steels now used extensively have a longer life in track than the early wrought iron or soft steels. They do have a tendency toward brittleness, and occasionally failures occur due to breaks in the rail.

The ideal rail should have a section of tough metal with a hard wearing surface. While such rails have never been produced commercially, at least in this country, the so-called *in situ* process has been developed for surface hardening. This is now being experimented on by the Toronto Transportation Commission under the direction of A. T. Spencer, assistant to the general manager, as described in this paper for June 14, page 922.

That the process does harden the rail surface is an established fact. It is to be hoped that the results obtained will be in every respect all that are claimed. There are many miles of rail in service that while partially worn, still have sufficient metal in the head to last for several years if the wear can be arrested.

The tests being made by Mr. Spencer indicate that the life of rails can be prolonged perhaps five years by the application of this process. It is quite inexpensive and does not require the track to be disturbed in any way. In fact, the work can be done at night without interruption to car traffic the next day.

With such possibilities before it, the tests of the process being made in Toronto will be watched with great interest by way engineers.

## It Pays to Do a Good Job in the First Place

THERE may be some question as to the desirability of building cars to have long life, because merchandising value as well as cost of maintenance must be taken into consideration, but there is no such question about building track to have the longest possible life. It is more expensive to tear up the old track and replace it every few years than it would be to do a real job of construction in the first place. Moreover, tearing up the pavement and relaying the rail involve interruptions to service and inconvenience to the general public. This element, although difficult to evaluate in dollars and cents, should not be overlooked.

Probably the most interesting point developed by the track joint survey which appears elsewhere in this issue is the opinion expressed by a number of way engineers that poor original construction is to blame for the majority of joint failures. Convincing evidence in this direction is furnished by the experience in Atlanta, where it was found that all of the joints made on one rail by a particular construction gang developed defects, while those made at the same time on a parallel rail by a second gang remained in good condition. This incident seems clearly to indicate that the quality of the original workmanship is a vital factor in the life of the joints.

In line with this theory is the idea that repairs should be made by installing the best type of modern joint rather than by replacing the defective joint with another of the same kind as that used in the first place. Most railway companies appear to favor the practice of installing the best joint.

Perhaps the most convincing way of expressing the soundness of a policy of excellence in track construction was outlined recently by a prominent way engineer who remarked, "When I get through with this job I want people to remember how long the track lasts, not how little it cost to build it."

## Horse Power— or Brain Power

ALL THE track laborers on one good-sized Eastern railroad, numbering perhaps thousands, develop a working effort of only some 300 hp., according to its president. That is the way he would rate them as machines, figured from the actual work their muscles perform. On this basis man-power is the most expensive kind of power in the world.

Then why continue to employ man-power to do the work of a machine? If the man does the work no better and the cost is more, there is not much argument in favor of the man. The value of man-power comes in direction of effort, so that instead of supplying a large quantity of brute force, a much smaller amount can be applied intelligently to produce the desired result faster. Going a step further, the man need not apply the power at all, but only supply the directive force to control a machine.

But unless the man can think and perform a duty that cannot be done equally well by a machine, he is not fulfilling a real place in the present scheme of things. Even today too many men, not only in the ranks but in more important positions, are supplying little more than horsepower; they let some one else do the thinking for them and merely carry out the designs of others, often not as well as a good machine can do.

Opportunities for doing things better and for rendering real service are missed repeatedly, and as a result not only the men themselves but the properties of which they form a part fail to progress as they should.

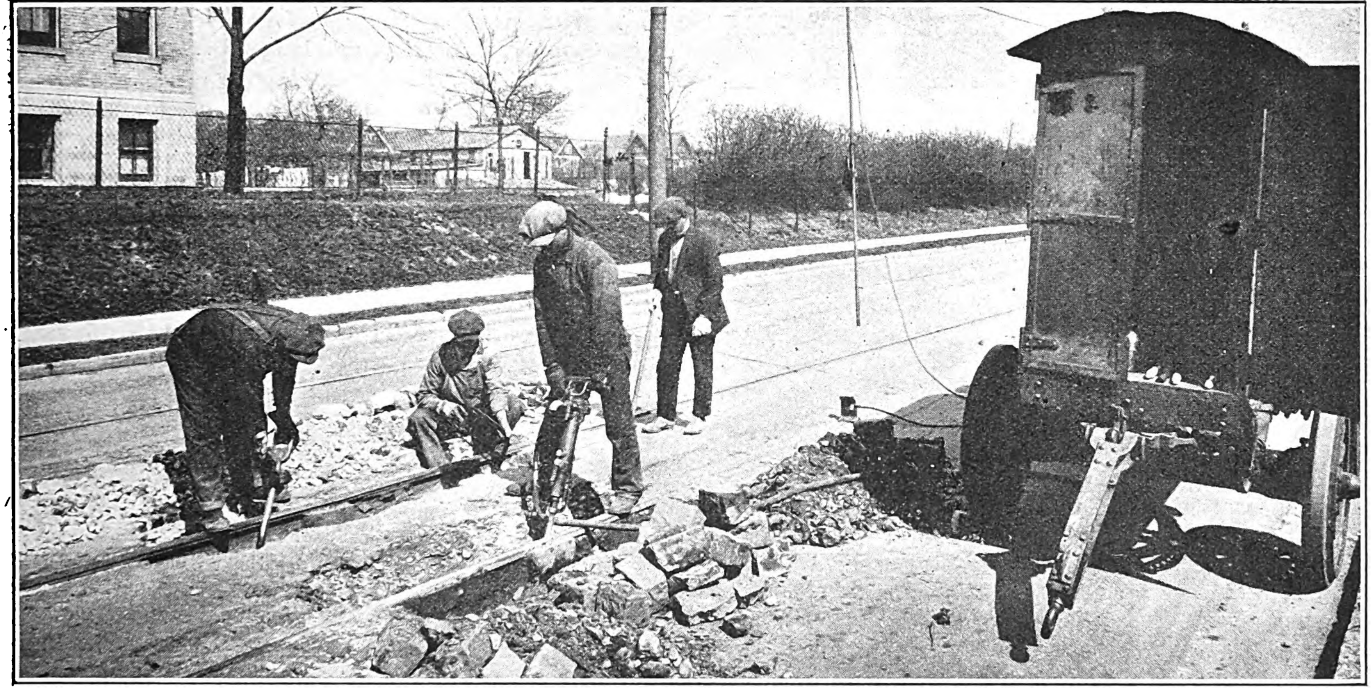
Let each of us stop and consider—am I supplying brain-power or only horsepower? Is my work so mechanical that I can be replaced by a machine which can do it better and at less cost?

## Maybe It's Not So Bad to Have a Fickle Public

SOME electric railway executives lament the fickleness of the public. Today the majority of people may appear to sympathize with the aims and objects of the railway and be willing to help in their accomplishment, while tomorrow the tide of public opinion may be running strongly against the traction company. We have all seen instances of that kind. Often it has been some vote-seeking politician with more oratory than facts at his command who has inspired sudden change in attitude. Without doubt it is a hardship on a railway to have the support which it needs suddenly withdrawn. But perhaps it is not so bad as it seems. Knowledge of the fickleness of the public should serve to keep the railway management alert and energetic in providing service that is above criticism. In other words, the company must keep its patrons sold on the idea that it is doing its job well. That is the unvarying basis of good public relations.

# Track Joint Failures—Cause and Repair

## A Survey by the "Journal" Shows that a Number of Way Engineers Blame Failure on Poor Original Construction—Maintenance Methods of 14 Railways Are Described—How Battered Joints Are Built Up by Welding—Granite Block Paving Is Favored



When Making Joint Repairs in Milwaukee the Practice Is to Remove the Paving with Air Tools for a Width of About 12 In. on Each Side of the Rail and for a Length of About 3 Ft. on Each Side of the Joint

THE consensus of opinion among way engineers developed by a survey made by ELECTRIC RAILWAY JOURNAL is that failure of track joints can usually be attributed to poor original construction. A variety of methods are used to determine whether or not a joint should be opened up for repairs. In making repairs most railways appear to favor the use of the best type modern joint rather than the installation of a joint of the same kind as the original. For paving along the rail granite blocks are thought by a majority of these engineers to be the most satisfactory material.

Concerning the causes of joint failure in Baltimore, W. W. Wysor, chief engineer United Railways & Electric Company, says: "In bolted joints the most frequent cause of failure is improper fit of the joint and failure to keep it tight. Failure may also be due to improper design of the joint plate, but assuming that plates have sufficient strength and are designed with proper bearing area, both top and bottom, the failure is then probably due to improper fit or improper tightening of the joint in the first place or failure to hold it tight.

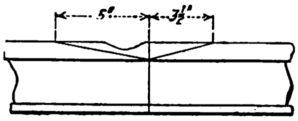
"When it comes to welded joints, it would be very difficult to say what is the most frequent cause of failure. That would, of course, depend upon the type of welded joint used and the particular methods employed in making the welds. But one thing in my opinion which is essential to the success of all joints in paved streets, whether they be bolted or welded, is the elimination so far as possible of any space between the ends of the rails and that the head of the rail throughout the joint should be continuous, of uniform section and uniform metal. If some form of welding is employed where the heads of the rails are actually melted together, care should be taken not to change the chemical or metallurgical properties of the steel, and the proper contour of the rail, if disturbed, should be restored. Where the rail heads are not melted together, but merely abutted, precautions should be taken to make joints just as tight as possible. The heads of the rails should be milled to a smooth true surface and the rails should be drawn together in the field by the use of drift bolts or by some form of compression machine."

Carelessness in making the joint, in the opinion of C. A. Smith, superintendent of roadway Georgia Railway & Power Company, Atlanta, Ga., is responsible for most failures. Instances have occurred in Atlanta where both the left-hand rails of a double-track line have broken down at the joints, while both the right-hand rails remained in good condition. Investigation showed that the same construction gang had made the joints on both of the good rails and a different gang had made the joints that had failed.

The most frequent cause of joint failure, according to B. H. Eaton, engineer maintenance of way Los Angeles Railway, is loosening of the plates, causing the receiving rail to cup. As this cup grows deeper it entirely destroys the joint either by breaking the plate or the rail. Another frequent cause of joint failure is loose track, allowing too severe bending moments to occur under wheel loads.

The Los Angeles Railway has found that joint failures are far more frequent in the so-called rigid type of construction than in more resilient types. This is thought to result from crystallization of the rail, caused by the pounding of the car wheel, rather than from loose track or cupping. Very serious trouble has been experienced on all the rigid tracks of this company.

The Chicago & Joliet Electric Railway has found the most frequent cause of joint failure to be poor original workmanship. It has been the experience of this company that a joint which is not properly supported will fail under a very small amount of traffic.

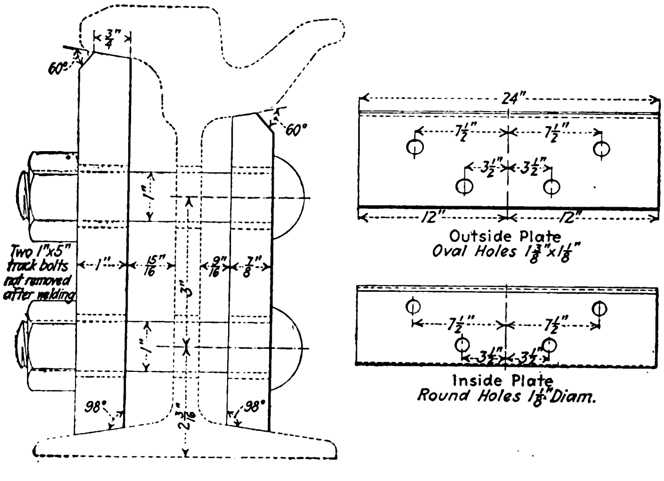


**The Union Street Railway, New Bedford, Mass., Cuts Back on Both the Damaged and the Good Rail Before Building Up a Battered Joint.**

A similar opinion is expressed by A. T. Spencer, assistant to the general manager, and formerly way engineer, Toronto Transportation Commission. Mr. Spencer says: "On mechanical joints under continuous service there occurs in many places cupping of the receiving rail. Should the joint be poorly supported there will develop a rail movement at the joint. This causes wear on the fishing surfaces of the plates and rail, which in turn causes the joint to deteriorate more rapidly. Defects in welded joints in our experience have almost invariably been traced to poor quality of welding workmanship or possibly a break in the rail outside of the joint plate."

From experience in Milwaukee, it is believed by R. H. Pinkley, engineer way and structures the Milwaukee Electric Railway & Light Company, that joint failures in general are due to imperfections in the joint itself. It is pointed out, however, that there are cases where other causes contribute to such failure. The most common of these are failures of the foundation due to poor subsoil or undermining of the track.

Improper fitting of the rail ends or joint connection or bad bonding are blamed by S. Clay Baker, engineer maintenance of way East St. Louis & Suburban Railway, for joint failure. In the case of bolted joints, loose bolts are sometimes responsible for failures.



**Seam-Welded Joints Used by the Chicago Surface Lines. Bolts Are Left in Place and Spot Welded**

Most of the track built in Chicago since 1907 under the specifications of the Board of Supervising Engineers has been 9-in. 129-lb. girder rail on concrete or crushed stone foundation, using Lorain electric welded joints. Concrete has been used extensively for paving foundations in various types of construction.

Electric welded joints are specified as standard construction except at special work and the process has proved satisfactory and economical under existing conditions wherever traffic can be rerouted, handled on temporary tracks or the construction carried out on one track at a time with traffic using the other. Most of this work has been performed on a contract basis under the terms of which the life of the joint was guaranteed and the railway paid a fixed price per joint.

During the general construction program subsequent to 1907 a complete record of all track joints was made, identifying them by house numbers along the streets. As repairs have become necessary these records have been maintained, so that an almost complete history of all the joints on the system is now available. This furnishes a good basis for analysis of the merits of various types of construction and repair methods.

Such an analysis made for a group of 176,000 joints put in by the Lorain welding process during the original construction period showed a failure of slightly less than 1 per cent per year for the first 10 years of the life of the new track. This analysis was made for track under heavy traffic. On light traffic streets the percentage of joint failures over a period of 15 years showed even better results.

### DETERMINATION OF NEED FOR REPAIRS

Personal observation by an experienced track man is the method most widely followed to determine when a joint should be opened up for repairs. Among the railways using this procedure are the Boston Elevated Railway, Twin City Rapid Transit Company, Memphis Street Railway and the United Railways & Electric Company of Baltimore. In Baltimore, however, repairs are often made following the complaint of some individual or organization or at the request of the municipal authorities before the repairs are really necessary in the judgment of the railway.

In the case of an old-time structure which will require reconditioning within a year or two, the Los Angeles Railway does not pay as much attention to poor joints as is paid in the case of comparatively new structures where it is expected to get 10 or 12 years more life. In an old structure this company considers that a joint should be repaired when it is entirely broken and will cause damage to the rolling stock or be dangerous to operation. In a comparatively new structure any joint showing signs of cupping or becoming loose is opened up for repairs. Not only the actual joint which has failed is opened up but also the joint opposite. Track joints are placed opposite in Los Angeles instead of being staggered. Ties are tamped up. New plates are then installed and seam welded.

In Atlanta also the character of the pavement is an important consideration in determining the time to open up a joint for repairs. With an expensive pavement this is done as soon as cupping of the rail is noticed. In Memphis if the rail is so badly cupped that it cannot be ground smooth the joint is opened up. The Chicago & Joliet Electric Railway, on account of limited funds available for maintenance work, opens up joints for repair only after they have commenced to pound or have given other indications that something is loose or broken. Mechanical joints are occasionally opened up and repaired when they become defective electrically.

The practice in Milwaukee is to keep joints in such condition as to avoid complaints due to rough riding or pounding. Whenever joints are in a condition to cause damage to the surrounding track or paving structure they are repaired. In the opinion of Mr. Pinkley the chief factor which affects the degree to which such maintenance can be extended is the ratio of earnings to operating expense.

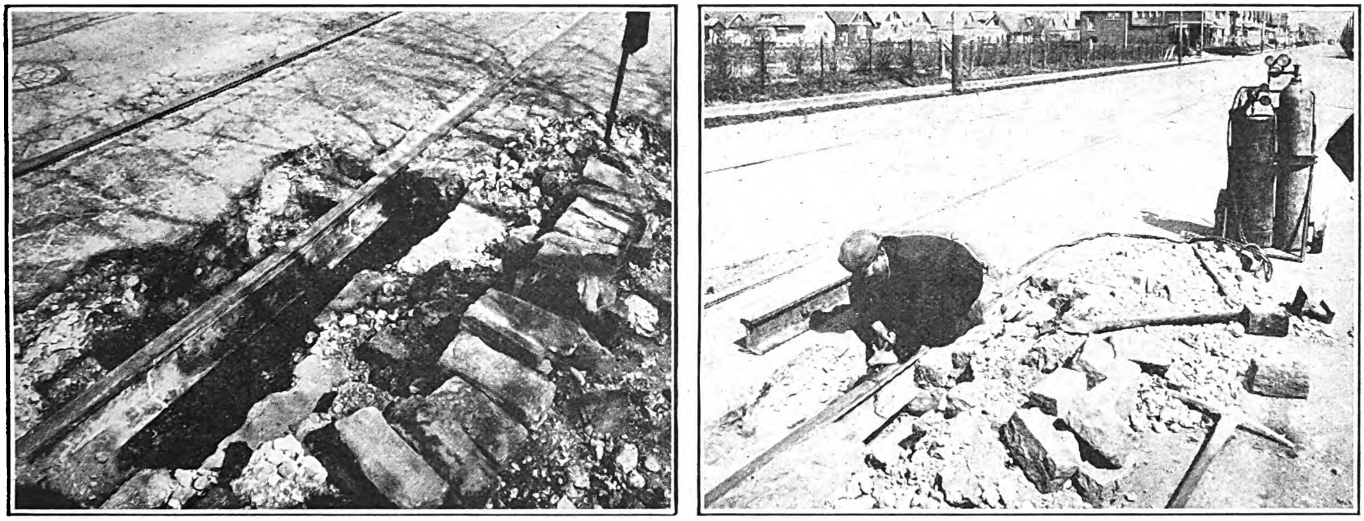
In Toronto a cupped receiving rail is given early attention. Otherwise the rapidly increasing depression might require the installation of offset joint plates and the joint would have to be opened up anyhow to accomplish this. It is felt therefore that it is not worth while to postpone needed repairs. Sometimes wave motion of the rail at the joint necessitates the opening up. Movement of the rail ends is used also by the East St. Louis & Suburban Railway as an indication of the need for joint repairs.

On the Chicago Surface Lines both the division maintenance forces and the track switch cleaning and maintenance men make observations of the condition of rail joints in their divisions. Any defects which require immediate attention are reported by telephone as soon as possible and emergency repairs are made to relieve the condition until a permanent repair job can be done. In the spring all the track on the system is inspected by trackwalkers sent out by headquarters and tabulations are prepared by sheets showing the condition of joints on each line. These records are used in planning the spring and summer repair program.

There is considerable diversity in the sizes of the areas of paving removed in making repairs. In the case of repairing a single joint in Baltimore paving is removed by pick or crowbar for a distance of 10 in. to 15 in. each side of the rail and for whatever length may be necessary. In other words, no more paving than is absolutely necessary is removed. Sometimes it may be necessary to do some surfacing beyond the joint, and for this reason a slightly larger area of paving may have to be removed. In Minneapolis most of the paving in the track area is of granite block. Outside of the track it may be wood block, brick or asphalt. Granite block paving is removed by workmen with sledges and bars. Wood block or brick paving is removed with picks. The area opened up is approximately 18 in. wide on each side of the rail and extends a foot beyond the cut.

Concerning pavement removal in Toronto, Mr. Spencer says: "If the pavement is a unit one and only one or more joints need attention the blocks are removed by hand labor, using bars and picks. Should a series of joints in the same locality require attention, it may be economy to send an air compressor outfit with chisels and drills to do the job. In the case of an asphalt or other homogeneous pavement it may be economy to use air equipment for even a small number of joints. If a joint requires to be opened up for attention to the plates only, the area opened is about 4 ft. long and 12 in. wide inside and outside of the rail, or just room enough to remove the old and install the new plates. If the rail is loose for a distance either side of the joints a larger area would be opened."

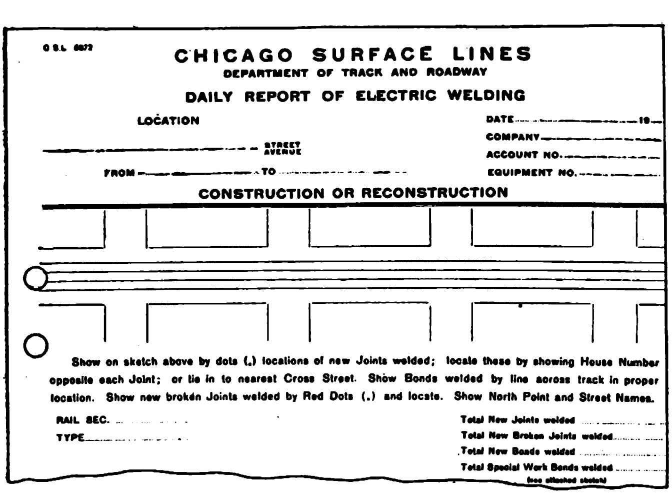
Pneumatic tools are used by the Milwaukee Electric Railway & Light Company to remove paving for a width of 12 in. on each side of the rail and for about 3 ft. on each side of the joint. In Los Angeles paving is removed by hand on small jobs and by compressed air drills on larger ones. The area opened up is about 2½ ft. long and 2 ft. wide, 1 ft. on each side of the rail. All paving along the tracks of the Chicago & Joliet Electric Railway is brick and it is removed with picks and shovels. No more paving is removed than is absolutely necessary to make the repairs. In Memphis, also, paving removal is done by hand. It is interesting to note that in New Orleans the nuts on track bolts are inside the rail and can be reached without disturbing the outside pavement. A description of the track construction methods of this company was published in ELECTRIC RAILWAY JOURNAL, May 17, 1924.



**At Left, a 4-Ft. Dutchman Is Ordinarily Used by the Milwaukee Electric Railway & Light Company.[3] At Right, in Cutting Out a Section of Rail the Head Is Sawed with a Hacksaw and the Web and Base Are Cut with an Acetylene Torch**

The Boston Elevated Railway uses pneumatic tools and a portable air compressor for paving removal whenever the construction is of concrete or granite block with grouted joints. An area about 4 ft. long and 18 in. wide on each side of the rail is opened up. In East St. Louis it is sometimes necessary to open up a sufficiently large area to raise the ties and retamp them. In other cases extra plates are used on top of the existing tie plates to bring the rail to the proper surface and a smaller opening suffices.

A majority of way engineers from whom information was obtained on the subject of joint repair appear to favor a policy of installing the best possible type of joint rather than installing again the same kind that was originally used. In this connection Mr. Wysor says: "All of our joints in paved streets are, or have been at some time, welded, excepting joints through special work, or where a joint failure has occurred in old track and we have not considered it worth while to reweld. At present all of our joint welding is either thermit or arc seam weld. If failure occurs in



CHICAGO SURFACE LINES
DEPARTMENT OF TRACK AND ROADWAY
DAILY REPORT OF ELECTRIC WELDING

LOCATION
DATE ............................ 19...
COMPANY ............................
———————— STREET / AVENUE
ACCOUNT NO. ............................
FROM ———————— TO ............................
EQUIPMENT NO. ............................

CONSTRUCTION OR RECONSTRUCTION

Show on sketch above by dots (.) locations of new Joints welded; locate these by showing House Number opposite each Joint; or tie in to nearest Cross Street. Show Bonds welded by line across track in proper location. Show new broken Joints welded by Red Dots (.) and locate. Show North Point and Street Names.

RAIL SEC. ............................
TYPE ............................
Total New Joints welded ............................
Total New Broken Joints welded ............................
Total New Bonds welded ............................
Total Special Work Bonds welded ............................
(see attached sketch)

New Joints Are Located by Sketch on the Daily Electric Welding Report of the Chicago Surface Lines

joints of this type they are repaired with the same kind of construction. But if failure occurs in one of the older forms of welding, such as cast welding or bar welding, the repair is made by putting in either one or the other of our present forms.

"When old track which is built of light rail sections and which has reached the point where it will be necessary entirely to reconstruct it within a short time we do not attempt to reweld the joints that have failed. It would be extremely difficult to make a satisfactory weld on old and badly corroded rail of light section and we do not believe the expense would be justifiable. We therefore cut out the broken or otherwise defective joint and insert a piece of rail of the same section and one that is worn to approximately the same extent and install a bolted joint which gives satisfactory service until such time as the track is reconstructed."

In Minneapolis the practice for the last five or six years has been to repair joints by cutting out a section of the original rail and adding a splice which is held in place by four bolts and a seam weld. On the Milwaukee Electric Railway & Light Company's lines the thermit process is generally used in making new joints, although some of the old joints are of different type. When making this kind of weld on short sections of rail it is the practice to make one weld at a time, allowing the rail to cool completely before the second weld is made. At Toronto it is customary, when the condition of the rest of the rail warrants it, to replace a mechanical joint with a welded joint. In cases which require only the tightening up of the bolts the joint is not welded.

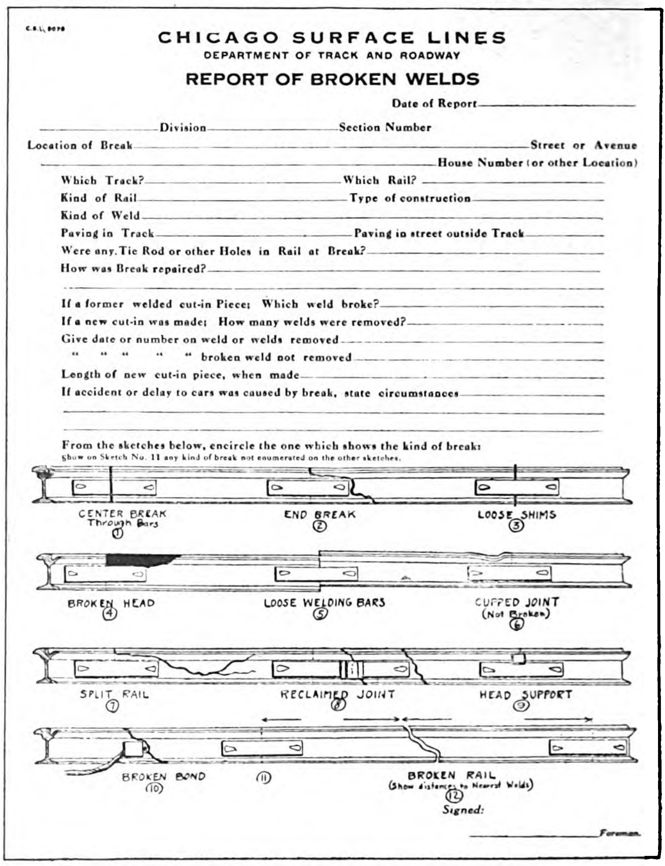
The Georgia Railway & Power Company now ordinarily installs welded joints irrespective of the original construction. Although joints were in the past replaced by new joints of the same type on the Chicago & Joliet Electric Railway, all joints are now made by welding. On the other hand the Boston Elevated Railway, the Memphis Street Railway and the East St. Louis & Suburban Railway replace joints with construction identical with the original. The Los Angeles Railway repairs joints with construction of the same type except in the case of cast welds or thermit welds, which are replaced by seam-welded joints.

On small reconstruction jobs, particularly in making repairs to broken standard joints, the Chicago Surface Lines uses seam-welding equipment on account of its low investment cost and flexibility in handling. For repair work where joints are scattered this equipment can be shifted readily from point to point along the right of way. Except in the congested districts a large part of this work can be done during the daytime without delay to car traffic. As the same equipment is used for making repairs to damaged rail ends it allows such work as cutting in new sections of rail and building up tops of the joints to be carried out with a minimum amount of shifting of equipment and delay in completion of the job.

In South Chicago much of the track construction has a concrete paving foundation on top of rock ballast. Joints in this track were originally of the cast weld type. Tee rail was used and when a bad joint was encountered it was the practice for a time to cut out the old cast weld and splice in a piece of rail approximately 18 in. long, welded on by the contact process. A 4-ft. bar on either side was held in place by four welds.

This type of repair has the advantage of giving a continuous single bar contact between the rail ends. It was, however, very expensive for this class of track and since the adoption of the seam-welding process the latter has been used with good results. Where the cast weld is intact but a piece of the head breaks out near the joint it has been found practicable as a temporary measure to weld in a new piece of rail head by the seam process, thus requiring only a minimum amount of paving to be removed and allowing the old cast weld to remain in place. In some cases worn sections of rail heads are built up with the welder to give additional life.

Most railways follow the practice of building up damaged rail ends by welding and then grinding the surface smooth. In Atlanta it is customary to build up by welding in case the rail is cupped to a depth greater than ¼ in. If the cup is less than ¼ in. deep



CHICAGO SURFACE LINES
DEPARTMENT OF TRACK AND ROADWAY
REPORT OF BROKEN WELDS

Date of Report ————————
———————— Division ———————— Section Number
Location of Break ———————————————— Street or Avenue
———————————————— House Number (or other Location)
Which Track? ———————— Which Rail? ————————
Kind of Rail ———————— Type of construction ————————
Kind of Weld ————————————————
Paving in Track ———————— Paving in street outside Track ————————
Were any Tie Rod or other Holes in Rail at Break? ————————
How was Break repaired? ————————

If a former welded cut-in Piece; Which weld broke? ————————
If a new cut-in was made; How many welds were removed? ————————
Give date or number on weld or welds removed ————————
" " " " " broken weld not removed ————————
Length of new cut-in piece, when made ————————
If accident or delay to cars was caused by break, state circumstances ————————

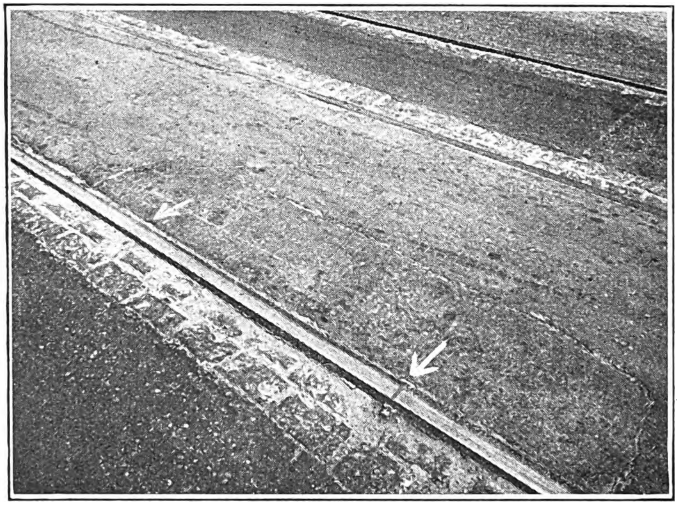
From the sketches below, encircle the one which shows the kind of break:
Show on Sketch No. 11 any kind of break not enumerated on the other sketches.

Signed:
———————— Foreman.

An Additional Report Is Made of Each Broken Loraine Joint Repaired, Giving Full Information Regarding the Break and Showing by Sketches Its Exact Nature the joint simply is made smooth by grinding. The Memphis Street Railway and the East St. Louis & Suburban Railway build up battered joints by welding. This is done also in Baltimore if the joint is otherwise in good condition. Welding and grinding are done in Toronto, although in some cases it has been found possible to use offset plates and then grind down the rail without the introduction of any welding material. The Twin City Rapid Transit Company follows the practice of cutting off the ends of damaged rails. Welding and grinding are done only in the case of a slight cupping. The Boston Elevated Railway builds up by electric arc welding when the rail ends are only slightly battered.

If the rail is simply cupped and the fishing surfaces are in fair condition the Los Angeles Railway makes repairs to the ball of the rail by metallic arc welding process. If the rail is broken either in the ball or, as frequently occurs, in the web, a section of rail is replaced with a "dutchman." This procedure is practically identical with that followed by the Chicago & Joliet Electric Railway.

When Making Thermit Weld Joints on Short Sections of Rail It Is the Practice in Milwaukee to Make Only One Weld at a Time, Allowing the Rail to Cool Completely Before the Second Weld Is Made


Granite Blocks Along the Rail and Reinforced Paving Elsewhere Have Given Good Results in Milwaukee. The Completed Repair with These Materials Shows a Neat and Workmanlike Appearance

An interesting method of repairing damaged rail ends has been adopted by the Union Street Railway, New Bedford, Mass. A diagonal cut 5 in. long is made in the cupped rail with an acceptable torch, as illustrated on page 960. A similar diagonal cut 3½ in. long is made on the sound rail. The object of cutting back on the good rail is to give the new welding metal a bearing and eliminate any possible drop at the joint. After the cuts have been made the surfaces are thoroughly cleaned. Then the weld is started at the bottom of the gap and continued until the gap is half filled. The process is interrupted at that time because of the possibility of the new welding metal burning if too large an area is filled in at once. If that occurred the joint would be likely soon to fail. The weld is begun and ended at the gage line of the rail because there is more metal to expand and contract there. After the cuts have been filled in by welding the surface of the rail is ground smooth.

Almost all railways use "dutchmen" under certain circumstances, but there are wide variations in practice as to the length of the piece inserted and the circumstances under which it is done. Moreover, way engineers differ as to nomenclature. Some call such a piece "an insert" and say that they do not use "dutchmen" at all.

The practice of the Toronto Transportation Commission is to use "dutchmen" from 4 in. to 12 in. long. This is done, however, only when the rail is broken or parted from the web. Various methods of repairing the joint in this way have been tried. Perhaps the most satisfactory, in the opinion of Mr. Spencer, has been with the use of a special pair of welding plates 36 in. long with bolts passing through both sections of the old rail and the "dutchman" also. The railway, however, does not contend that this method of repairing a joint has been altogether successful.

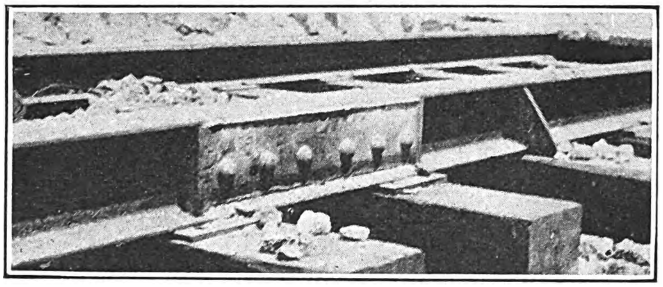
According to H. M. Steward, superintendent of maintenance, the Boston Elevated Railway uses an insert when the cupping is too serious to be repaired by welding. When the gap between the rail ends is too wide to permit the use of inserts a "dutchman" 12 in. long is used. On the other hand the Milwaukee Electric Railway & Light Company never uses a "dutchman" of shorter length than 4 ft. The Georgia Railway & Power Company uses "dutchmen" varying in length from 10 in. to 20 in. Joint plates 52 in. long are used in this work. The minimum length of a "dutchman" used by the Los Angeles Railway is 5 ft.

The only place where the United Railways & Electric Company of Baltimore uses "dutchmen" is in closing up a piece of new work. Mr. Wysor says: "We attempt to avoid the use of 'dutchmen' just as much as possible, and in fact they are very seldom used. But occasionally after closing rails have been cut there is a drop in temperature which makes it necessary to install a 'dutchman,' or wait until the rails expand enough to close the opening, or to cut in new rails. We can generally overcome the trouble by waiting for a change in temperature to expand the rails, but sometimes this is not possible and we then resort to a 'dutchman,' which may be anywhere from ¼ to 1 in. in thickness. This is arc welded in place."

It is the practice of the Twin City Rapid Transit Company to install "dutchmen" where broken and battered sections of the rail at the joint are so short that cutting out 18 in. of rail will remove the defect. In such a case a piece of rail of the proper length is inserted and splice plates 34 in. long are bolted and seam welded in place. In Memphis "dutchmen" are used in two ways. They may be either short pieces only 2 in. or 3 in. long or pieces longer than 6 ft. In the former case a single joint is made and in the latter case two separate joints. The East St. Louis & Suburban Railway uses "dutchmen" only in the case of temporary repairs. When it is necessary to cut in a piece of new rail the joints are placed approximately 15 ft. apart and the piece inserted and it therefore can hardly be classed as a "dutchman."

Where the paving is good along the rail and the track has the proper gage the Chicago & Joliet Electric Railway inserts a short "dutchman" and welds it in place. If the rail is in bad condition and it is planned to replace it in the near future, a "dutchman" about 9 in. long may be used with holes through the piece to be inserted and continuous joint plates. Ordinarily "dutchmen" 4 in. long are used by the Milwaukee Electric Railway & Light Company.

In Chicago in addition to the method of splicing in a piece of rail about 18 in. long, as already described, it is a practice where the weld is loose and the rail ends are damaged to insert a new section of rail 12 ft. in length and to seam weld each of the new joints. In many cases where the rail is badly worn it was formerly the practice to weld in short blocks above the joint bars, making a chock to support the head and lip of the rail. This practice has now been abandoned in favor of using 12-ft. sections of new rail. In the use of the seam welding bolts are left in place.



In New Orleans Track Bolt Nuts Are on Inside of Rail, Where They Can Be Reached Without Disturbing the Outside Pavement

Often it is necessary to do more to improve the condition of a rail joint than simply to build it up by welding and then grind the surface smooth. In this connection the Chicago & Joliet Electric Railway says: "If the rail ends are bent down they are straightened up with a special device which we have for this purpose and a reinforcing plate is put under the base of the rail. The battered ends of the rail are then built up with an electric welder and ground off to a smooth surface. Generally if any other portions of the rail are out of surface they are raised by means of steel shims on the ties, or if more than 1 in. out of alignment they are raised and supported on wooden blocks." A device of this kind used by the Springfield Street Railway, Springfield, Mass., was described in ELECTRIC RAILWAY JOURNAL for March 29, 1924.

Steel or wood shims are used also by the Toronto Transportation Commission. The Twin City Rapid Transit Company, the Georgia Railway & Power Company and the United Railways & Electric Company of Baltimore all follow similar practices. It is the practice of the last-named railway if the rail is only slightly out of surface above only a few ties to bring it back to grade by inserting steel shims or tie plates between the rail and the tie. If, however, the track is very much out of surface and is in that condition for a long distance a larger area of paving is removed and the tracks reballasted. This is frequently necessary over openings made in the streets for sewers, water pipes or other purposes and where trenches were not properly back filled.

In Los Angeles if the rail joint is simply loose and the rail has not been damaged beyond slight cupping it is the practice to install new plates and seam welds. Any small gaps between the rail ends are plugged with a thin shim of the same section as the ball of the rail. If the surface of the rail at the joint is low a portion of the adjacent track is dug out, the ties are raised sufficiently to bring the track to grade and thoroughly tamped.

In Chicago very few cases have been found where the track is in a condition requiring the grade to be restored. This occurs only where adjacent building construction has caused a settling of the track foundation. Otherwise the foundation is usually found to be in good condition. In the few cases where the foundation has given way, a large scale reconstruction program usually has been necessary, and consequently joint repair work was not attempted. When the rail has become worn so that grade variations occur from this cause, steel shims cut and drilled to correspond with the tie plates are sometimes used. This practice is not strongly favored, however, and is used only when absolutely necessary. Where a break occurs in the rail head cars are kept running by means of temporary jumpers until permanent repairs can be made. These are cast-steel devices of special design and are so arranged that they simply drop in place over the joint plates.

### GRANITE BLOCK PAVING IS POPULAR

Among the companies favoring granite block pavement along the rail are the United Railways & Electric Company of Baltimore, Georgia Railway & Power Company, Boston Elevated Railway, Toronto Transportation Commission, Twin City Rapid Transit Company, East St. Louis & Suburban Railway, Milwaukee Electric Railway & Light Company and Chicago Surface Lines.

This paving has been used for some time in Chicago both between the rails and also for the track zone outside the rails. It is considered the only practical type of paving where heavy vehicular traffic is encountered. In outlying districts where traffic is lighter brick paving has given satisfactory results. Some railways favor the use of grout between the blocks, while others prefer a bituminous filler. In the former category are the Toronto Transportation Commission, the Milwaukee Electric Railway & Light Company and the Boston Elevated. At the present time the East St. Louis & Suburban Railway is laying granite block pavement with a bitulithic filler. The idea in this is that it relieves the noise and vibration to some extent and also makes the paving structure more nearly waterproof. The Georgia Railway & Power Company and the New Orleans Public Service are other railways which favor a mastic filler between the granite blocks.

A few railways prefer an entirely different sort of pavement. The experience of the Memphis Street Railway with an asphalt pavement on a concrete foundation has been very satisfactory. The Chicago & Joliet Electric Railway has found brick paving to be satisfactory and economical. Mr. Eaton says: "We have adopted (in Los Angeles) as our standard paving a 6-in. cement concrete base with a 2-in. asphalt top, as we believe it to be the best for use in this locality. It permanently seals the structure and will not allow water to seep between the paving and the rail. We have a number of miles of this construction which was installed some 10 or 12 years and shows no signs of cracking along the rails, and when necessary to open up for installation of special work, etc., we have found the rails to be in as perfect condition as when it was originally installed, showing no signs of rusting or electrolysis. The cost of repairing this class of paving is probably somewhat greater than that of asphalt concrete paving because it is harder to remove."

The Los Angeles company is so well satisfied with paving of the character described in the preceding paragraph that all paving repairs along the tracks are made in this way regardless of the original construction. When joint repairs are made by the Milwaukee Electric Railway & Light Company the original granite blocks are put back along the rails and new concrete is put in to fill the holes. An accompanying illustration shows the finished appearance of a completed joint repair job. Reinforced concrete with granite blocks along the rail is now considered the most desirable form of paving for Milwaukee, both from the standpoint of cost and wear and also ease in making repairs.

The Chicago & Joliet Electric Railway has found that the original paving bricks are usually in fairly good condition and the unbroken ones can be turned over and reused. After repairs are made and the rail is tight the hole is filled in with a rich concrete mixture up to the paving subgrade and then brick paving is installed. It has been the experience of this company that about 60 per cent of the paving bricks can be salvaged and used the second time. The Twin City Rapid Transit Company and the Boston Elevated are other railways which reuse the original material so far as possible.

In Toronto, if the paving is a unit one, the old blocks are usually replaced. The paving base, of course, is not taken out, but new concrete is tamped under the base of the rail and brought to the former level. An asphalt surface on a concrete base is often used. In East St. Louis the original paving blocks are put back, but a bitulithic filler is used instead of cement grout, to allow traffic to pass over the repair more quickly.

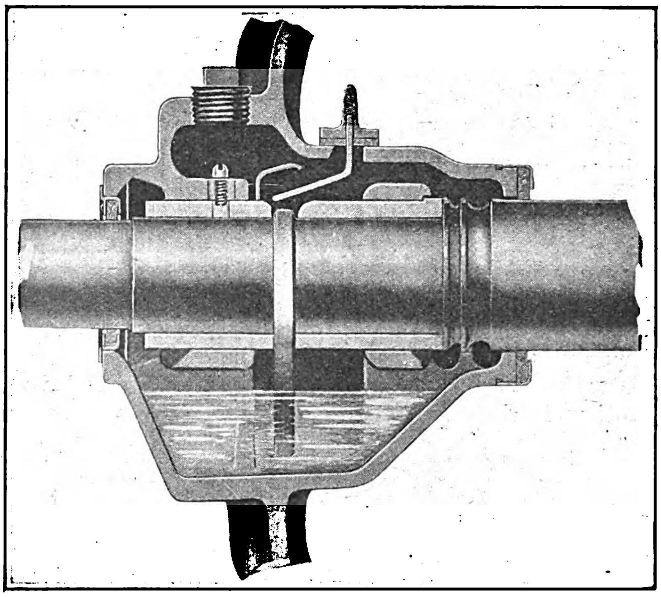
In Baltimore if the original paving consists of some kind of blocks such as brick, wood or granite and is in good condition the same blocks are put back. Generally speaking, however, wood block is so broken or split that it cannot be put back and new material must be substituted. If the old bricks are badly worn they are discarded and new ones substituted, the same being true of granite and other forms of blocks. Where asphalt is laid it is, of course, necessary to put in new material. Ordinarily, after the track repairs are completed, the concrete paving base is installed and the old block laid in place temporarily until the concrete base has had sufficient opportunity to harden. The wearing surface is then restored in a permanent manner similar to the original construction.

Granite block paving is used throughout almost the entire track area in Chicago, and the original blocks are replaced after joint repairs except when they are broken. The granite blocks are always laid with cement grout and on this account a certain number of them are sure to be broken during the removal. In Atlanta the same type paving is ordinarily put back after the railway has made a joint repair. However, asphalt is sometimes substituted for wood blocks, which have not always proved entirely satisfactory as paving along the tracks.

## Leakproof Sleeve Bearing Developed

A NEW TYPE of sleeve bearing for electric motors, designed to prevent the leakage of oil into the windings or the entrance of dust and grit into the bearing, has been developed by the Westinghouse Electric & Manufacturing Company. This new bearing is directly applicable to motors for railway shops and, no doubt, will result in improvements in the bearings for motors of rolling stock.

A connecting passage in the upper part of the bearing housing secures a condition of balanced air pressure in the separate chambers into which the housing is divided by the bearing supports. The action of the blower at high speeds sets up a vacuum next to the inside end of the housing and, since it is impossible to seal the housing absolutely at that point because the shaft passes out there, the vacuum is communicated to the space within the housing itself. If the upper passage were not provided, an unbalanced air pressure would result whenever the oil level rose high enough to close the lower cored openings.



This Bearing Is Sealed Against the Entrance of Air or Dust and Prevents the Leakage of Oil or Oily Vapor Into the Motor

For inspection of the oil ring, a large air-tight threaded pipe plug is provided. An inclosed combination filling and overflow opening is placed in the side of the bearing and a rigid cast-iron cover is bolted over the oil-ring slot and made airtight by an oilproof packing.

Where the shaft passes through the bearing, an improved method of supporting the felt dust-proofing washer is used. For the purpose of lending resilience to the soft felt, the metal cap has a diameter at least ¼ in. larger than the shaft diameter. This prevents the felt from being compressed close to the shaft, which would cause it to become glazed and hardened and soon to burn and wear out.

The airtight construction of the bearing prevents the passage of air through the bearing and at the same time prevents oil from being drawn into the motor windings. The oil ring, carrying oil from the oil well to the motor shaft, stirs up and churns the oil into a fine spray, which, in the ordinary type of bearing, is sucked into the motor and covers the windings.

The bearing requires practically no attention, and oiling once or tice a year is all that is necessary.

# "Anything Is Possible When We Have to Do It"*

### The Working of Economic Laws, the Superior Efficiency in Use of the Street, Intelligent Sales Effort and Good Use of Publicity Will Bring Electric Railways Back Into Their Own

*By H. G. Taylor*

President National Association of Public Utility Commissioners,
Member Nebraska State Railway Commission

IT IS NOT for me to point the way to prosperity for the street railway industry. Street railway transportation will respond ultimately to the unerring influence of economic law. Unfortunately, there have been too many theories about the operation of street railroads. They have been made laboratory specimens for every political tinkerer who could win his way into a place of authority. These transportation "specialists" have been in accord only on one thing—and the ill-fated Akron slogan well epitomizes it—"a nickel or nothing." Blissfully unconscious of changing conditions, increasing costs and the development of the motor vehicle, these human dodoes have maintained an unwavering faith in the power of municipal fiat. If the city ordinance is made to say that street cars can operate for 5 cents, that solves the problem.

During the past 10 years this country has had a rebaptism in the doctrine that government is omnipotent and that such things as wages, fuel, prices, maintenance, business management and other unpleasant facts are immaterial and irrelevant. Indeed, we are assured quite stridently that these things are mentioned only to postpone the dawn of a new day and delay the coming of the industrial millennium. Old King Canute had much the same idea. He marched down to the seashore one sunny morning, followed by the retinue of his court and a number of his subjects, to give a demonstration of his power as a monarch. When the stage was all set, he made a magnificent gesture of authority and commanded the waves to recede.

## ECONOMIC LAW MUST GOVERN

It has been said that it is given unto every man once to make a consummate ass of himself. King Canute measured up to the full limits of his opportunity. The only excuse history has for remembering him is that he made such a fool of himself. At that, however, he displayed more wisdom than some of his modern imitators, for when he returned to the palace he sorrowfully admonished his subjects to take note of the spectacle he had made of himself and never thereafter attempted to interfere with the laws of nature. The Akron, Saginaw, Des Moines, Seattle, Detroit and numerous other street railway debacles furnish emphatic evidence that political demagogues are slower to learn than King Canute. And since thinking has gone out of fashion within the halls of Congress our national legislators have manifested the same brand of stupidity. If anything is wrong, pass a law. Pass a law whether anything is wrong or not. Let the statutes command the sun to stand still and the waves to recede and the rivers to run up hill. Compared with some of the proposals put forth by our uplifters and lawmakers Canute's command was a sage and sensible suggestion.

But I started out to say that the street railway problem will yield ultimately to the action of economic forces. There is a place for the street car. For the moment we do not know just where that place is or how large it is to be, but as the use of the automobile is rapidly reaching the point of saturation the relative importance of the street car is more easily measured.

## MOTOR VEHICLES HAVE LIMITATIONS

There are 15,000,000 motor vehicles in the United States. In the classic language of Grover Cleveland, that is a "condition and not a theory." Some one has figured out that if all these motor vehicles were placed in a column 15 abreast the line would extend from New York to San Francisco. Assuming an average value of $750 for each vehicle, the total aggregates the staggering sum of $11,250,000,000. The development of the automobile is one of the amazing phenomena of American life. The automobile is here to stay. It has become a permanent factor in the commercial and social life of the country. It is a recognized unit in the transportation situation. The problem, therefore, for the older established forms of transportation like the railroad and the street railway is to study the problem as it is changed by the new competition.

Already it is becoming apparent that the rosy prophecies of the motor vehicle manufacturers will not all be realized. The prediction that old Dobbin would have to go is now being qualified. A use for the horse still exists. For short-haul deliveries in congested areas he can be utilized to better advantage than the auto truck. And the tractor is not to supplant him on the farm. General utility at lower cost justified his continued use in that capacity. Buses for long-haul transportation have not as yet justified themselves, although there are hundreds of hardy and hopeful souls who are willing to continue the experiments. They are not succeeding notwithstanding public concessions as to free use of highways, exemption from taxation and freedom from regulation of rates and service. Once the novelty has worn off and the public settles down to accept them as ordinary common carriers their problem will be all the more difficult. If they cannot succeed under present very favorable conditions they cannot hope to do so once they are subjected to the economic test that comes sooner or later to all enterprises.

Manifestly, therefore, the whole transportation problem is in an experimental stage, awaiting the final adjustments made necessary by the advent of the motor vehicle. The future from the street railway standpoint, however, is not without its promising aspects. While there are 15,000,000 automobiles in the country today, it is comforting to remember that during the period of this remarkable development there has been an increase in population of about 25,000,000. And more comforting still to your industry, this increase in population has been very largely in the cities. While the street car traffic has not kept pace with this growth, due to the use of the automobile as a substitute, present conditions indicate that we may be on the eve of another step in the readjustment, forced by the infirmities of the automobile itself.

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*Abstract of address delivered before first annual meeting, Mid-West Electric Railway Association, Omaha, Neb., June 12, 1924.

### OBSERVATIONS SHOW INEFFICIENCY OF THE AUTOMOBILE AS A TRANSPORTATION MEANS

A 10-hour observation of auto traffic along O Street, Lincoln, Neb., reveals that on an average five automobiles carry a total of seven persons. The daily traffic report of the street railway company shows that approximately 18,000 passengers are carried each day by street cars. The cars make 1,017 round trips—or 2,034 one-way trips per day. This means that an average of nine passengers are carried on each car per one-way trip.

The average seating capacity of street cars in Lincoln is about 36 passengers. Accordingly, 75 per cent of the service rendered during the entire day is wasted because it is not patronized.

An observation taken on Fifteenth and O Streets between 4 p.m. and 6 p.m. on May 19 showed that 53 street cars going east carried 1,481 passengers while 757 automobiles going in the same direction carried 1,079 passengers. For each street car carrying 28 passengers there were 14 automobiles carrying 21 persons.

The automobiles that passed during that time, if placed in a single line, would cover a distance of 1⅓ miles. The line of street cars would be three-tenths of a mile long.

On an average of one and one-half persons per automobile, it would have taken 18 autos to have carried the 28 people who rode a street car, or 987 to have carried all the street car passengers—nearly one and one-third times more autos than did pass during the two hours. The automobiles necessary would have formed a line nearly 4 miles long.

Nature brooks no violations of her laws. Punishment is swift and certain. Traffic congestion in our cities will ultimately be relieved because society will reach the conclusion that it cannot pay the appalling cost. Automobile manufacturers have already anticipated this development and are leading in the movement for safety regulation. The day of the unlicensed, unrestricted, unregulated use of the motor vehicle is approaching its sun-down. Human life is more precious than personal liberty. Sheer necessity will compel a more restrained use of the automobile. When it does the street car will return to a measure of its former popularity. For the movement of large numbers of people into, out of and through congested areas at low cost it has no equal. Like old Dobbin, however, it has lost prestige. In addition to having been made the prey of designing politicians, it has lost countenance with the general public through no fault of its own, but because its flashy and luxurious competitor has made a more romantic appeal to the public mind.

It is at this point that the recovery of the street railway industry begins. Old methods will necessarily have to be discarded with old conditions. Exemptions from special taxes and paving assessments must be secured. Further relief through rate increases is not to be expected until you can convince your patrons it is worth as much to ride in a street car as in a bus or taxicab. So far as that remedy is concerned, it is a job of salesmanship—the task of giving the public a new and more wholesome viewpoint. In the slang phrase of the street, the street railway industry has "got to go and get a reputation." Expressed in another way, a time-tried and valuable commodity must be put in a new and attractive package. When the inevitable reaction from the misuse of the automobile arrives the street railways must be ready to take advantage of it.

More efficient methods of operation must be developed, one-man cars should be further perfected and utilized, greater efficiency in equipment should be devised. You say that is not possible. I say anything is possible when we have to do it. And your industry has reached the crisis in its career when the *"must"* of the situation has become the dominant note. The public, whether it realizes it or not, must have street car service. It must be educated to that fact. You who are in the business must find ways and means of giving that service.

When the Germans had reached Verdun and threatened the very gates of Paris, the indomitable will of France found glorious expression and victorious fulfillment in the cry "They shall not pass!" That genius for overcoming obstacles that has been the characteristic of American progress will find a way in your industry. Last, but not least, the human element in your business must yield the full measure of its wonderful possibilities.

### PUBLICITY IS NECESSARY

The frank disclosure of information hitherto considered private and confidential has gone far to create a wholesome confidence in your good purposes. In this work your Committee on Public Utility Information has performed a conspicuous service. As one engaged for fourteen years in the newspaper business, I have a profound respect for the value of publicity. In these modern days, it is one of the essentials to the success of private business. To the public utility, operating as a monopoly, it is even more necessary and should be provided for with as much certainty as labor, fuel or capital. It must be intelligently prepared and placed, however, and skill and training of a high order are required. The bookkeeper or the plant superintendent cannot take an hour off once a week and prepare this material.

It is to the credit of the industry that it has taken its publicity work seriously and has perfected organizations in each state that have already developed a more healthy public opinion. Some one in this twentieth century has coined the very significant phrase—"the fanaticism of veracity." Perhaps it is a little too strong, but in a day of loose talking, mendacious assertions and wholesale appeals to prejudice, we need to get down to first principles, and I would recommend that the phrase be printed and framed, and hung in the office of every publicity representative as a constant reminder of the great need of eternally emphasizing facts. Not that these men have not been disseminating the truth, but that in the face of wholesale misrepresentation their unremitting vigilance is imperative.

A straight line is the shortest distance between two points. This is as true of life as it is of geometry. It applies to the relations of men with each other. This is so despite the complexities of the twentieth century. The homespun days have gone, never to return. The simplicity of life is passing away. We live on the main highway and every passing caravan leaves a new contact. In the language of David Starr Jordan, "We must cultivate the social tact, the gentleness, the adroitness, the firmness necessary to carry out our own designs without thwarting those of others."

### Co-operation Is the Law of the Hour

Whether we like it or not, we must co-operate. It is the law of the hour. It is another phase of human progress. Being compelled to work together we must cultivate anew the knack of getting along with each other. And in that respect the fundamental rules of conduct are still in force. The hearty handshake, the cheery greeting, the cordial exchange of ideas are as potent as ever.

And this brings us to the thought that there is no inherent conflict of interest between the utility and its patron. When I go to a merchant to buy a pair of shoes, I get something I need and I give him something he needs. It is a mutually beneficial transaction—a fair exchange. When the Ampere Electric Company sells 275 kw. of current to Citizen John Condenser it gets cost and a little profit. John Condenser gets some energy which he uses for his comfort or profit. There is nothing in the exchange itself to excite hostility. And yet, strange to say, there has been permitted to grow up a traditional resentment in the mind of Mr. Condenser for the company. What ought to be a happy relationship has developed into a strained neutrality, unfortunate for both. Intelligent co-operation is the one and only remedy.

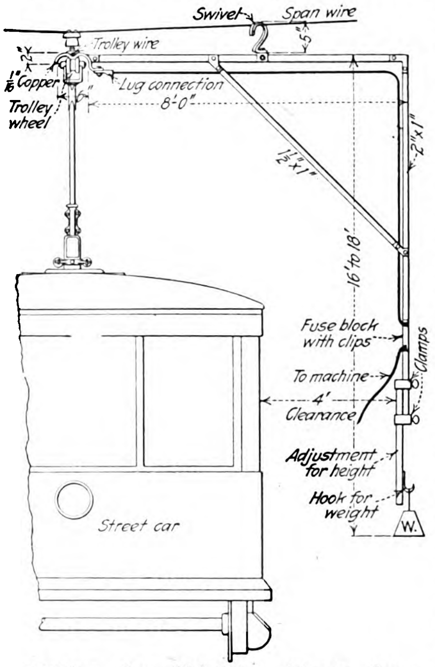
The railroads have made the approach to a better understanding through the formation of shippers' conference boards. These boards have been a common meeting ground for the exchange of complaints and ideas. The results have been amazing. Ancient grudges have disappeared. Misunderstandings have been cleared away. Suspicion and prejudice have dissolved under a frank disclosure of all the facts. Feelings of good will and friendliness have been kindled and controversies that had grown into "problems" have vanished like mist before the sun. And this happy condition of affairs has been as surprising to railroad men as to shippers. The procedure is simple, and it is sufficient only to bring the parties together in orderly fashion. Human contact does the rest. The experiment has demonstrated that when men with common interest and common purpose meet about a council table in an effort to reach a common understanding success is assured from the start. Under our very eyes the great and perplexing problem of transportation is being composed through the very simple process of the two parties at interest—the public and the railroads—sitting down to talk it over.

Another conspicuously successful adventure in co-operation has been undertaken by the federal and state commissions. For years they quarreled over jurisdiction. Overlapping authority produced friction and ill-feeling. Dealings were at arm's length. The situation was almost intolerable, and then one day some one thought of trying the plan of getting together to talk it over. The conference was so successful that a permanent plan for co-operation was devised, remarkable for its simplicity. Within two years mutual distrust has disappeared, confidence and good will have been substituted. Controversies that formerly culminated in lawsuits and rigid orders have yielded to joint action, and the powers of local and federal authority have been co-ordinated to the great advantage of all concerned.

Co-operation is practical. It works. It is not sentimental, but the finest sentiment grows out of it. Its possibilities are unlimited. The only wonder is that we have been so long discovering it.

## Overhead Contact Permits Passage of Cars

A DEVICE for obtaining power from the overhead trolley wire for track tools, which allows the passage of cars without removing the contact from the wire, is used by the surface track division of the Brooklyn-Manhattan Transit Corporation. The contact is a sheet copper pan with a groove formed in its upper surface which is placed under the trolley wire. It is of 1/16-in. hard drawn copper, 10 in. long and 4 in. wide, the groove fitting snugly around the wire and providing a smooth underrun for the trolley wheel. This same type of pan was described in the Journal of Sept. 2, 1922, page 319, where the supporting pole was mounted on an Indianapolis welder. The use of the contact has now been extended to other track tools not affording a support close to the track. The copper pan, in its new application, is attached to the short end of an inverted L-shaped frame. The frame is suspended from a span wire by a swivel hook on the short arm, so placed that the arm will be suspended horizontally. Weights placed on the long or vertical arm of the frame tend to rotate the device about the point of support, causing the contact to be pressed against the wire.



**Apparatus for Obtaining Power from Overhead Trolley Wire Which Allows Passage of Car and Trolley Wheel Without Removing Contact from the Wire**

The frame is made up of 1-in. x 2-in. wood reinforced at the joints with steel plates. The short arm is 8 ft. long, while the long arm is 16 to 18 ft. long, being adjustable for various heights of span wires. A diagonal brace connects the two members of the frame.

Connection between the contactor and the lead-in wire is made through a lug bolted to a lip of the pan. A fuse block is mounted on the vertical member, near the lower end. The lead-in wire is connected to the top of this block, while the machine wire is connected to the bottom of the block.

Types of Cars Operated in New Orleans on Which Good Pull-In Record Is Made. On the Left Is a Modern Light-Weight Steel Car, in the Center an Older Double-Truck Car, and on the Extreme Right a Single-Truck Car

# 217,728 Car-Miles per Pull-In

## A Well-Organized System of Inspection and Repair Has Enabled the New Orleans Public Service, Inc., in 3½ Years to Eliminate 95 per Cent of the Pull-Ins and Cut Maintenance Costs to Half

*By Robert M. O'Brien*

Superintendent Rolling Stock and Shops, New Orleans Public Service, Inc.

IN MARCH, 1924, the New Orleans Public Service, Inc., operated an average of 217,728 car-miles for every car taken out of service on account of mechanical or electrical defects. This mileage should not be considered as an indication of what may regularly be expected in the future, however, but rather as a maximum figure resulting from a combination of particularly favorable circumstances during that month. Nevertheless the experience of this railway indicates that with proper organization and facilities it should be possible to maintain continuously an average of well over 100,000 car-miles per pull-in.

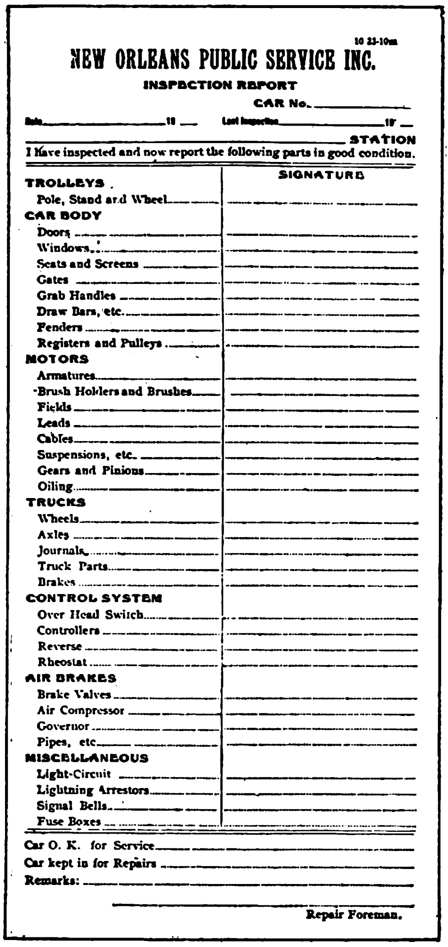
At the outset of a discussion of pull-ins it is well to explain the exact meaning of the term as used at New Orleans. Pull-ins are classified as "chargeable" or "not chargeable." A chargeable pull-in is any car which is removed from service because of the development of serious defects before the termination of its regular day's run as specified in the time-table. Cars which are removed from service because of accidents beyond the control of the mechanical department, such as automobile collisions, etc., are considered as not chargeable pull-ins.

Efforts are made to repair certain minor defects such as difficulties with the fare register, bell cords or gongs, by having a mechanic board the car as it passes the carhouse and travel with it for a short distance without taking such a car out of service. This is done more to promote the convenience of the passengers than to reduce the number of pull-ins, although, of course, it does have that effect also. Any car which is actually taken out of service before the termination of its daily run, however, is considered a pull-in, and is so listed in the records.

The secret of the elimination of the pull-ins lies in the development of an adequate system of inspection and repairs, the upbuilding of the morale of the mechanical department and placing the several carhouses on a competitive basis. Under the plan followed by this company the main office of the equipment department furnishes repair foremen with daily inspection reports showing the cars to be inspected, and separate cards detailing the parts to be examined. After the receipt of these cards at the stations, or carhouses, repair foremen notify the transportation department which cars are to be kept in the following day, and competent men are selected to make the inspection of the electrical and mechanical parts.

After making his examination of a car each inspector notes on a form specially prepared for that purpose the condition of the various apparatus. This report lists 34 different parts of the car equipment. Each part must be examined and if the inspector finds it in good condition he places his initials opposite that item on the card. The attention of the foreman is called to repair work that should be done by the absence of initials on the card. In such a case the foreman then calls a regular repair man to correct the defect and afterward O.K.'s the card. Cars are inspected on a 1,000-mile basis except some of the older rolling stock, which is inspected every 800 miles.

The number of miles run during the previous day by each car on the system is furnished to the equipment department by the auditing department at 1 o'clock every afternoon. The former department then tabulates the information on a large mileage sheet which shows for each car the daily mileage, the cumulative mileage since the last inspection and the total mileage



10 23-10m

NEW ORLEANS PUBLIC SERVICE INC.

INSPECTION REPORT

CAR No.________

Date__________19__ Last Inspection__________19__

__________STATION

I have inspected and now report the following parts in good condition.

| | SIGNATURE |
|---|---|
| **TROLLEYS** | |
| Pole, Stand and Wheel | |
| **CAR BODY** | |
| Doors | |
| Windows | |
| Seats and Screens | |
| Gates | |
| Grab Handles | |
| Draw Bars, etc. | |
| Fenders | |
| Registers and Pulleys | |
| **MOTORS** | |
| Armatures | |
| Brush Holders and Brushes | |
| Fields | |
| Leads | |
| Cables | |
| Suspensions, etc. | |
| Gears and Pinions | |
| Oiling | |
| **TRUCKS** | |
| Wheels | |
| Axles | |
| Journals | |
| Truck Parts | |
| Brakes | |
| **CONTROL SYSTEM** | |
| Over Head Switch | |
| Controllers | |
| Reverse | |
| Rheostat | |
| **AIR BRAKES** | |
| Brake Valves | |
| Air Compressor | |
| Governor | |
| Pipes, etc. | |
| **MISCELLANEOUS** | |
| Light-Circuit | |
| Lightning Arrestors | |
| Signal Bells | |
| Fuse Boxes | |

Car O. K. for Service__________

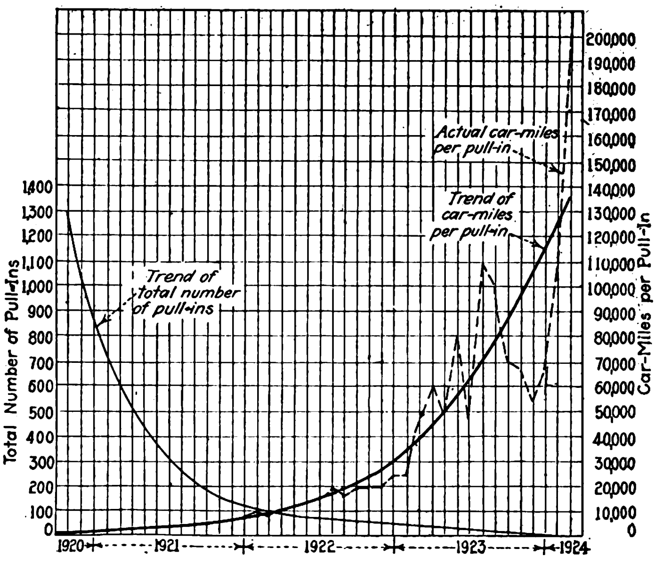
Car kept in for Repairs__________

Remarks:__________

__________
Repair Foreman.

The Inspector Must Sign for the Condition of Each Item on this Form

since the last general overhauling. Armature mileage for each motor is also tabulated on this sheet. Every Saturday the repair foremen are notified of any armatures which are approaching the mileage limit. Bearings are then immediately gaged for clearance between the armature and pole pieces. This is repeated weekly until the armature is removed for overhauling. At present all armature repairs, as well as repairs to trucks and wheels, are made at the various carhouses because the repair shops have not sufficient space in which to do the work. It is planned, however, to start an entirely new system of inspection on July 1. Under the new plan no armatures or fields will be removed at a carhouse, but the complete motors after having operated 40,000 miles will be sent to the assembly room at the Carrollton shop. There the motor will be knocked down and completely overhauled, tested and passed by an electrical engineer before being returned to service. Under this scheme it is thought that all electrical parts will be kept in nearly as good condition as when they were originally furnished by the manufacturer. It is planned to have extra trucks, motors, air compressors, controllers, line breakers, etc., so that all the vital parts of the car can be sent to the general shop, repaired and tested on this mileage basis.



A Steady Decrease in Pull-Ins Is Shown During the Last Four Years

The selection of 40,000 miles as a basis for the removal and overhauling of electrical equipment was made because experience showed that thorough examination and tests usually were needed after that length of operation. However, this figure was selected only tentatively and if it turns out that the expense of overhauling every 40,000 miles is exorbitant, the mileage will be increased. It is firmly believed, however, that a thorough overhauling and examination of equipment by a young graduate engineer will result in the discovery of many hidden defects and will prove to be a real economy.

Competition between the different stations is fostered by the publication of comparative records. A statement of cars taken out of service on account of defects is furnished monthly to the management and to all minor officials of the equipment department. It is placed also on the bulletin boards at all the carhouses. This is done so that each individual in the organization will know exactly what is being accomplished at the others.

The form is divided into the two major classifications already mentioned, pull-ins chargeable to the equipment department and those not so chargeable. Among the chargeable defects are such items as armatures rubbing poles, hot journals and charged cars. The classification of pull-ins not chargeable to the equipment department includes the items derailment, broken glass, accidents, split switches and troubles reported but not found. This tabulation shows at a glance the number of cars taken out of service at each of the five carhouses for these various reasons. Comparative figures for the previous month and the same month the preceding year are also given. At the bottom of the sheet the number of car-miles per pull-in is shown for each carhouse. Each repair foreman is therefore able to compare the work being done at his station with that being done at the other stations of the railway.

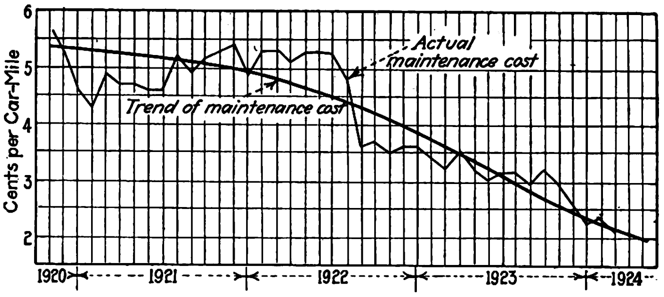
A statement of expenditure showing the amount of money spent on materials and labor in the various shops and carhouses is prepared monthly. While the primary effort has been to reduce the number of pull-ins, it has been the aim to accomplish this without running up large maintenance costs. The two accompanying charts show very clearly the success that has been attained by the company not only in increasing the car mileage operated between pull-ins, but also in reducing the maintenance cost per car-mile. In 3½ years the average miles per chargeable pull-in has been increased from 1,380 to the maximum of 217,728 mentioned above. At the same time the maintenance cost has been reduced from $0.057 to $0.021 per car-mile.

The reorganization which has accomplished these results was made on Nov. 1, 1920, under the new management which took over the operation of the company just prior to that date. The important part that should be played by the equipment department in giving good service to the public was immediately recognized. This department was acknowledged to be a vital cog in the railway mechanism, rather than being considered, as is so often the case, merely as a kind of necessary evil. The superintendent of equipment and the master mechanics at the various carhouses were provided with suitable offices and office equipment. If the master mechanic has an office in which to work and a desk at which to sit, he goes at his work in a different spirit from that of the man who has to use an old packing case shoved off in some dark corner of the repair shop.

A program of regular meetings of station foremen once a month was inaugurated. At these meetings the various problems of the mechanical department are discussed and methods to overcome them are proposed. Genuine attention is paid to the views of every individual, and no attempt at dictation is made by the superintendent. With the idea of teaching them what the other fellows were doing and broadening their viewpoints, master mechanics, inspectors of equipment and foremen were sent to various railway shops and manufacturing plants in other cities. These trips were of material benefit to the company and have resulted in the abandoning of many old methods in favor of newer ones.

Previous to the reorganization of the mechanical department the engineering for that branch of the railway was done at the general engineer office of the company. Now, however, an engineer is employed to work directly with the equipment department, and his services have been invaluable. It is planned to extend this idea still further. Additional engineers will be secured and it is expected that the equipment department will then be able to do all of its own design, inspection and testing work. The technical knowledge possessed by an engineer, especially in connection with the testing of electrical apparatus, is felt to be an absolute essential in the efficient operation of the equipment department.

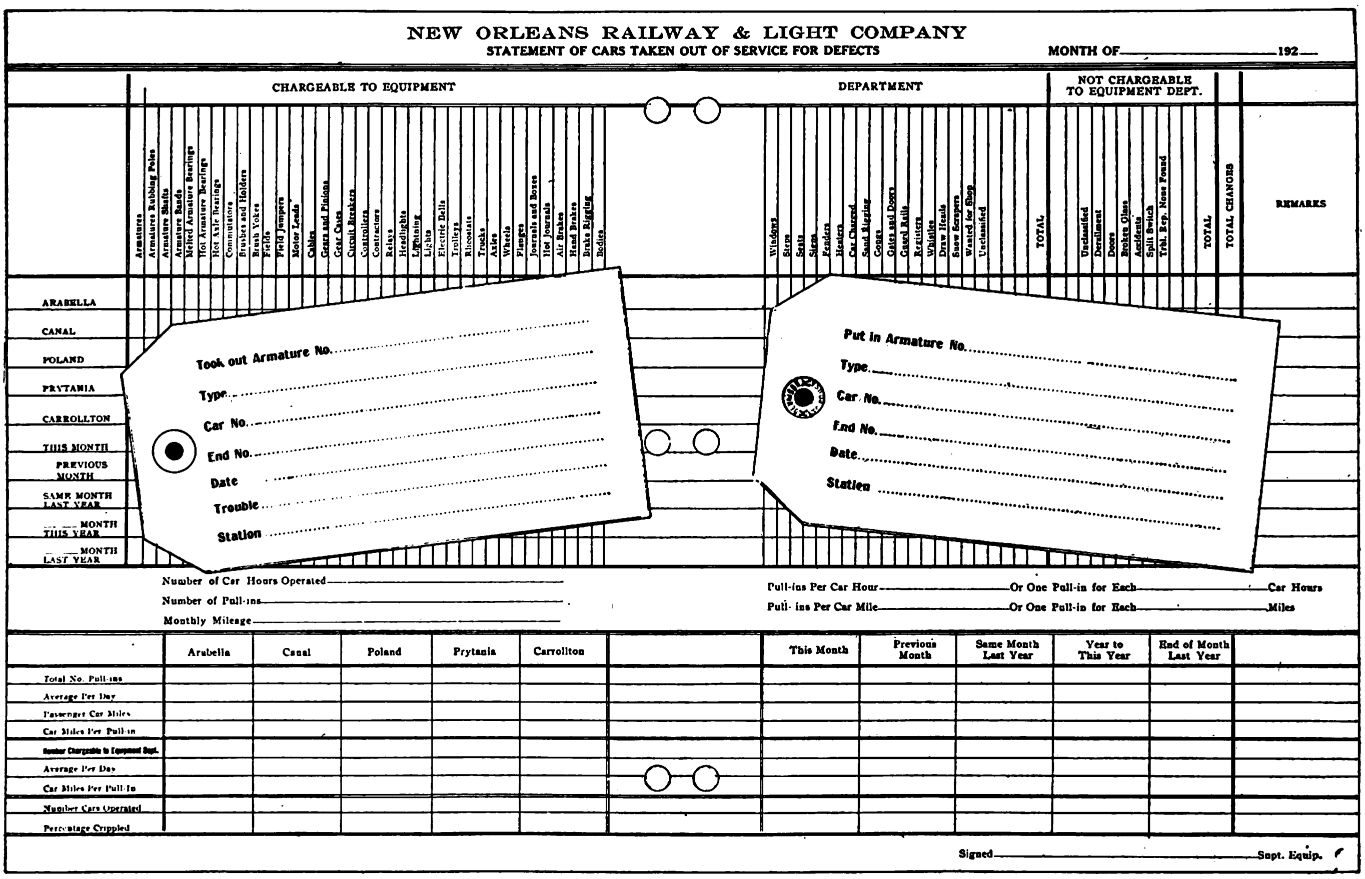
New cars and equipment have been purchased. Dipping tanks and baking ovens have been installed and have proved to be particularly valuable. Car hoists and cranes have been installed so that the men can do their work easier and better. By degrees the improved conditions were appreciated and a new spirit introduced with this department.



Along with the Reduction in Pull-Ins the Maintenance Costs Are Going Down

About 100 modern cars have been bought and are now in operation while 73 more are on order. The reduction in the number of pull-ins, however, cannot be attributed wholly to the operation of new rolling stock and the elimination of some of the older cars. More than 400 cars are in regular service in New Orleans, and the new ones, therefore, constitute only a fraction of the total. There are in operation a great many double-truck cars which are not new and about 200 old single-truck cars. Maintenance costs on cars of the latter type are high and constant care must be exercised to keep them in good condition and thus prevent pull-ins.

The recognition of the mechanical department by the executive heads of the company, the purchase of modern rolling stock and proper tools to enable the men to perform their work efficiently, and the development of a regular system of inspections and repair have created a spirit of enthusiasm and a desire to co-operate for the general welfare of the railway. The result of this has been better car service in New Orleans.



NEW ORLEANS RAILWAY & LIGHT COMPANY
STATEMENT OF CARS TAKEN OUT OF SERVICE FOR DEFECTS
MONTH OF________________192__

CHARGEABLE TO EQUIPMENT DEPARTMENT

Armatures
Armatures Rubbing Poles
Armature Shafts
Armature Bands
Melted Armature Bearings
Hot Armature Bearings
Hot Axle Bearings
Commutators
Brushes and Holders
Brush Yokes
Fields
Field Jumpers
Motor Leads
Cables
Gears and Pinions
Gear Cases
Circuit Breakers
Controllers
Contactors
Relays
Headlights
Lightning
Lights
Electric Bells
Trolleys
Rheostats
Trucks
Axles
Wheels
Flanges
Journals and Boxes
Hot Journals
Air Brakes
Hand Brakes
Brake Rigging
Bodies
Windows
Steps
Seats
Signs
Fenders
Heaters
Car Charged
Sand Rigging
Gongs
Gates and Doors
Guard Rails
Registers
Whistles
Draw Heads
Snow Scrapers
Wanted for Shop
Unclassified
TOTAL

NOT CHARGEABLE TO EQUIPMENT DEPT.

Unclassified
Derailment
Doors
Broken Glass
Accidents
Split Switch
Trbl. Rep. None Found
TOTAL

TOTAL CHANGES

REMARKS

ARABELLA
CANAL
POLAND
PRYTANIA
CARROLLTON
THIS MONTH
PREVIOUS MONTH
SAME MONTH LAST YEAR
___ ___ MONTH THIS YEAR
_____ MONTH LAST YEAR

Took out Armature No.\.\.\.\.\.\.\.\.\.\.
Type\.\.\.\.\.\.\.\.\.\.
Car No.\.\.\.\.\.\.\.\.\.\.
End No.\.\.\.\.\.\.\.\.\.\.
Date\.\.\.\.\.\.\.\.\.\.
Trouble\.\.\.\.\.\.\.\.\.\.
Station\.\.\.\.\.\.\.\.\.\.

Put in Armature No.\.\.\.\.\.\.\.\.\.\.
Type.\.\.\.\.\.\.\.\.\.\.
Car No.\.\.\.\.\.\.\.\.\.\.
End No.\.\.\.\.\.\.\.\.\.\.
Date.\.\.\.\.\.\.\.\.\.\.
Station\.\.\.\.\.\.\.\.\.\.

Number of Car Hours Operated__________
Number of Pull-ins__________
Monthly Mileage__________

Pull-ins Per Car Hour__________Or One Pull-in for Each__________Car Hours
Pull-ins Per Car Mile__________Or One Pull-in for Each__________Miles

| | Arabella | Canal | Poland | Prytania | Carrollton | | This Month | Previous Month | Same Month Last Year | Year to This Year | End of Month Last Year | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total No. Pull-ins | | | | | | | | | | | | |
| Average Per Day | | | | | | | | | | | | |
| Passenger Car Miles | | | | | | | | | | | | |
| Car Miles Per Pull-in | | | | | | | | | | | | |
| Number Chargeable to Equipment Dept. | | | | | | | | | | | | |
| Average Per Day | | | | | | | | | | | | |
| Car Miles Per Pull-In | | | | | | | | | | | | |
| Number Cars Operated | | | | | | | | | | | | |
| Percentage Crippled | | | | | | | | | | | | |

Signed__________Supt. Equip.

This Form Summarizes the Pull-Ins by Divisions and by Classification of Defects. The Insets Show the Armature Tags Employed

# Financing Purchase of Coal for Employees

### Plan Adopted by the Connecticut Company Has Enabled Its Employees to Secure the Quantities Needed at a Minimum Price

THE experience during the past winter of two large railways which undertook to finance the purchase of household coal for their employees was so satisfactory that the continuation of the plan is assured. The Connecticut Company was the originator of the idea and it has been followed by the United Railways & Electric Company of Baltimore.

So much enthusiasm has been shown by the employees of the Connecticut Company who availed themselves of the company's plan to distribute coal that the participation of a much larger number in a similar scheme next year is expected. A brief description of this plan was given in ELECTRIC RAILWAY JOURNAL for April 28, 1923. During the past winter 987 employees ordered 4,691 tons of coal at a total cost of $63,000. All of this coal was delivered prior to March 1, 1924.

The great difficulty in obtaining an adequate supply of coal for household purposes, as well as the abnormally high prices prevailing for such coal as was available, induced the company in the spring of 1923 to propose a plan to assure its employees an adequate supply at a reasonable price. Such employees as wished to avail themselves of the offer had their full winter's requirements of coal delivered during the summer at a time convenient to the retail dealers. Payment to the dealers was guaranteed by the railway and deductions made from each individual's weekly pay during the period from May to November. In this way the employees obtained advantage of the lower price possible through buying in ton lots rather than in smaller quantities. Moreover the plan enabled the dealers to deliver coal during the spring and summer months when there was slight danger of interruption in rail shipments. In a small measure it has tended toward greater equalization in mining activity.

Early last summer the United Railways & Electric Company undertook a similar plan. Up to Feb. 1, 1924, 1,952 orders had been placed with the company for 5,250 tons of coal at a total cost of $84,022. All but a very small percentage of this coal had been delivered and paid for up to that time. A quarter of 1 per cent of the total represents the loss through coal delivered but not paid for.

On the basis of an average price of $15 per ton the railway arranged to collect from its employees at the rate of 75 cents per ton per week. This meant that the account would be paid off in twenty weeks. The company pays cash for coal and takes advantage of the cash discount of 25 cents a ton, and this saving is passed on to the employees.

The plan has been so successful that at the request of the Employees' Benefit Association it has been extended to become a permanent part of the company's activities. Employees may order coal at any time of the year and pay for it as described. The company believes that if such a scheme were put into effect by other large employers of labor it would materially improve the peak conditions in the coal mining industry and give the employees the benefit of purchases at the summer season price without the need to finance the purchases so far in advance of actual need for the coal.

# The Readers' Forum

## *Believes Wheel Welding Can Be Done; Wants to Know Right Technique*

INDIANA, COLUMBUS & EASTERN TRACTION COMPANY

SPRINGFIELD, OHIO, June 6, 1924.

To the Editors:

I am very much interested in the reconditioning of steel wheels by building up the worn flanges by electric welding. This is not a new subject, as flange welding has been practiced for some years by a few mechanical men with varying success. In our own shop we have built up the flanges on several wheels that have given upward of 40,000 miles of service on our heavy cars, which performance is entirely satisfactory. On the other hand, we have had wheels develop serious cracks which we feel certain were due to welding the flanges, making them unsafe for use. I understand this has been the experience of practically every one who has undertaken to weld flanges.

These experiences have led some to abandon and condemn the welding of flanges as impractical and unsafe. But the fact that even a few welded wheels have been an entire success, also the fact that wheels from certain makers crack more than others, leads me to believe that universal success is a possibility. The reason that uniform results have not been obtained is no doubt because conditions were not uniform. My feeling is that we are all groping around in the dark and when we secure a good result we do not really know why or how we did it, likewise with a bad result.

My contention is that the steel wheel makers should take up the problem in a thoroughly scientific and practical manner and be prepared to supply the railways with wheels that can be successfully welded. They should also be prepared to furnish the proper welding rod and specify what rod to use on their wheels, together with the current strength, voltage over arc, etc., so that the railway men can depend on being able to do this work without fear of cracked wheels.

Recently I wrote on this subject to one company which manufactures steel wheels and the reply was that it was very much interested in this matter, as it felt that if worn flanges could be successfully renewed on steel wheels there would be but few chilled wheels sold, but that its engineers had been working for two years on the problem and so far had not met with success. In practically every attempt incipient cracks were discovered which tended to be progressive.

In this connection I am reminded of the slogan: "The fellow who says it can't be done is interrupted by the chap who is doing it." The wheel company men referred to gave me a very pressing invitation to visit their laboratory and assured me they could convince me of the impossibility of flange welding. Still I am not convinced and furthermore refuse to be convinced that this thing cannot be done.

In order to see what savings can be made by flange welding it first must be noted that in about 90 per cent of the cases sharp wheel flanges occur on one wheel only. Therefore, if this one flange can be renewed by welding, it will in many cases not be necessary to turn the treads down in the lathe, and if this process can be kept up, that is by renewing the flanges as they wear down, it should increase the ultimate life (or mileage) of the pair of wheels by some three to five times that obtained when wheels have to be turned down to a smaller size every time a sharp (or thin) flange develops. As to the saving that can be effected, I have made the following rough comparisons based on our practice, which I consider conservative:

| | |
|---|---|
| Cost of two new 37-in. steel wheels | $95.00 |
| Cost of mounting wheels on axle | 5.00 |
| Cost of turning pair of wheels three times | 4.50 |
| Total cost of two wheels present method | $104.50 |
| Probable total mileage | 200,000 |
| Cost per 1,000 miles | $0.52 |
| Cost per 1,000 wheel-miles | $0.26 |
| If flanges are welded they will probably have to be welded about eight times during the life of the wheels. | |
| Cost of welding flange on one wheel | $4.00 |
| Cost of welding flange on one wheel eight times | $32.00 |
| Total cost two wheels ($95 + 5 + 32) | $132.00 |
| Probable total mileage | 750,000 |
| Cost per 1,000 miles | $0.176 |
| Cost per 1,000 wheel-miles | $0.88 |
| | or about one-third the present cost |

The above figures certainly look attractive and I feel reasonably sure they can be attained and probably surpassed if the one point of dependability can be secured. My purpose in writing you is to enlist your support. What I am interested in is getting the thing "put across" by some means and I think the ELECTRIC RAILWAY JOURNAL is in a position to lend material aid in doing this. Possibly the manufacturers who are producing the welding outfits could also be interested in helping to put this over.

F. J. FOOTE,
Superintendent Motive Power and Equipment.

[Methods for neutralizing internal stresses from welding wheels were discussed in an article by W. J. Merten in the ELECTRIC RAILWAY JOURNAL for April 21, 1923. Several methods which have been used successfully were described in the Aug. 18, 1923, issue in connection with a survey of wheel, gear and axle practice.—EDS.]

## *Thinks Pneumatic Equipment Desirable*

NEW YORK, June 4, 1924.

To the Editor:

In reading my ELECTRIC RAILWAY JOURNAL of May 24 I was quite interested in noting several statements in your article on the new car design adopted by the Springfield Street Railway, and would like to remark on type of door control mentioned, which is not at all in harmony with the present trend of electric railway car design. It is mentioned that manual operation of the folding door is preferred to pneumatic operation because of the danger of freezing of pneumatic door engines and the piping. It has been my privilege to inspect electric railway operation from Sydney, Nova Scotia, to Fort Worth, Tex., and I have specially observed pneumatic door operation from every standpoint. The only cases of freezing that I observed, which were very few, have been due to conditions peculiar to the individual installation, which could readily be corrected and were. At this moment I have a vivid recollection of the little one-man safety cars in Sydney plowing through a blinding snowstorm without a gap in schedule and with perfect door operation. These cars were equipped with the safety car equipment and the doors operated by a pneumatic door engine.

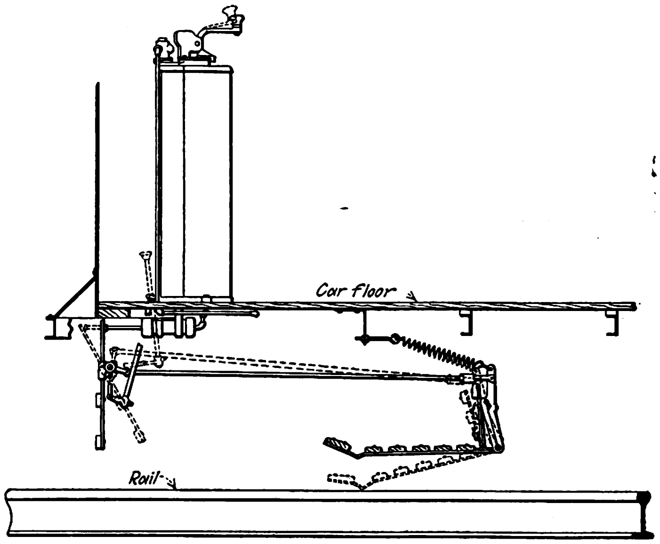
Another statement in your article criticises the sudden starting of cars where doors are interlocked with contactors or line switches, where the car is started by the closing of the doors. This is another case that can be controlled by proper installation. The Third Avenue Railway of New York City has used such operation for more than ten years through all the vagaries of New York traffic, and the resulting operation has been smoother than on the few cars which are not equipped with safety interlocking door control. The secret, if any, lies in using a sufficient amount of resistance on the first step of the controller with the proper grading of the resistance on the remaining steps. Furthermore, there are thousands of cars equipped with this type of safety interlocking door control throughout the country, all of which seem to be giving the very best results. This is progress, and it is impossible to stop progress of the right kind.

G. H. VANDER VEER,
Car Equipment Engineer National Pneumatic Company.

# Life Guard Operated by Air

### Connection for Safety Device Is Made to the Exhaust Pipe from the Controller Handle on Safety Cars

IN ORDER to make the operation of the life guard automatic the Savannah Electric & Power Company, Savannah, Ga., has equipped all of its safety cars so that the tray drops whenever the emergency devices function. An extension has been welded upward from the apron of the life guard and a cylinder similar to the circuit breaker knock-out cylinder is placed under the floor of the car. Connection to this cylinder is made from the exhaust air pipe from the controller handle. When the operator removes his hand from the controller this exhaust air operates a plunger which hits the welded extension to the apron and trips the tray.



Showing How Exhaust Air from the Controller Handle Trips the Life Guard

When the car is moving at a speed of 20 m.p.h. it has been found that the life guard can be dropped in a distance of 3 ft. After tripping, the tray is returned to its normal position by means of a treadle. Air connections to perform this work are being considered, however. A cut-out valve is placed under the floor below the controller, to eliminate the automatic feature if it should be so desired at any time. All safety cars of the Savannah Electric & Power Company have been equipped in this way at a cost of approximately $10 per car.

# Equipment Maintenance Notes

## Reclaiming Rail Bonds in Brooklyn

By G. H. McKelway
Engineer of Distribution
Brooklyn-Manhattan Transit Corporation

When bonds of the compressed and expanded terminal type were to be removed from tracks in Brooklyn, an old method was to cut off the terminals with a cold chisel and save only the length of the stranded conductor between the terminals. The part removed was turned into the storeroom and later sold as scrap copper. However, many bonds reached the junk dealers in a more direct but unauthorized way.

In order to prevent this waste a method of salvaging the complete bonds was tried. Instead of cutting off the terminals, these were punched out of the rail and those which were unfit for reuse in the condition in which they were removed were filed to necessary dimensions. This work was expensive, and a first-class job was seldom obtained, as the terminals when finished were not round and were too small to fill the holes in the rails and provide a proper sized button on the end. As a result, in reusing these bonds they were installed only in sidings or points where it was expected to relay the track.

An improved method of finishing the terminals is now being used which makes them suitable for reinstallation in place of new bonds. A special milling tool is used in a drill press. This has knife blades on the inside and lower end. With this milling tool fitted over the terminals, the excess copper from expanding the terminal in the web hole is quickly cut away to the exact dimensions required, and where the terminals are distorted from being driven out these are trued up. Some of the copper is removed from the shoulder of the terminal so as to make the stud long enough for reinstallation. This method enables the reuse of the bonds in rails with the same or even greater web thickness than those from which they were removed and a satisfactory button is obtained.

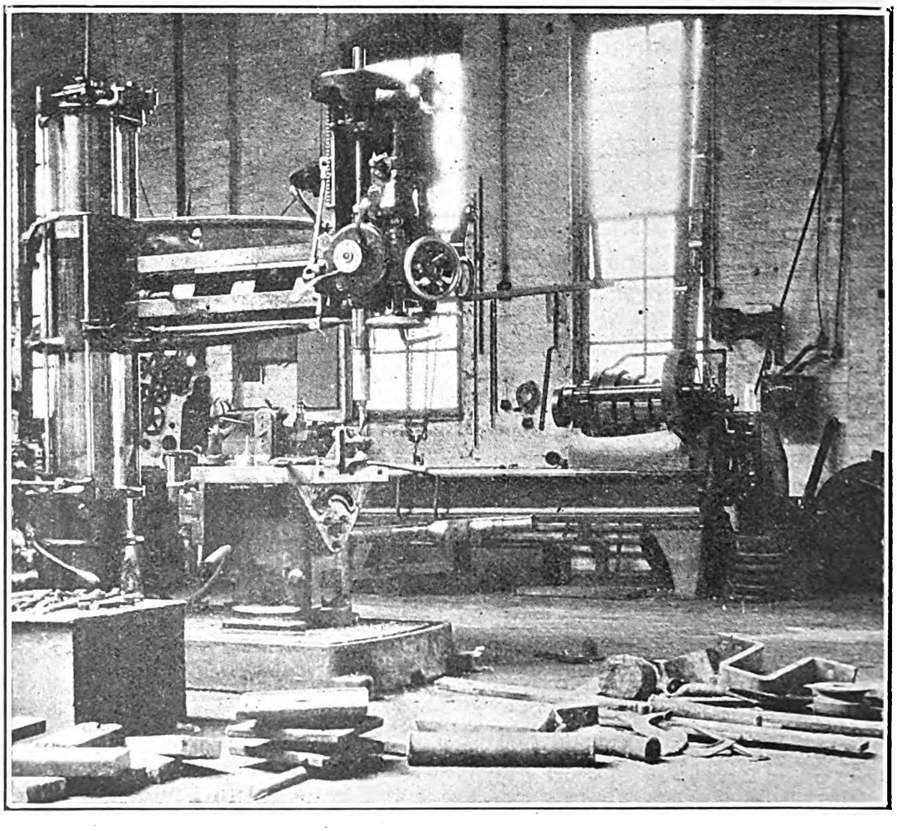
In some cases where a number of heavy bonds are installed in the same locality the studs of the bonds are cut from the terminals, leaving the sleeves in place around the end of the strands. The sleeves are then welded to the base of the rail. The sleeve around the end of the strands is of great advantage as it holds them tightly together until they can all be welded to the rail. It also prevents the burning of the strands, which might occur if heat were applied directly to the individual strands instead of to a number at the same time.

## High-Speed Drill Proves Economical

A Fosdick high-speed radial drill with Westinghouse control is used in the Fulton County plant of the Georgia Railway & Power Company, Atlanta, Ga., to drill material of all kinds—from brass to tool steel. For such articles as brake beams, levers, etc., which require several holes to be drilled, this machine is said to save from 50 to 75 per cent of the labor cost. For drilling single holes of small size, the new machine is not greatly superior to the old, but for large single holes, 2 in. or more in diameter, the saving by the use of this radial drill is from 75 to 80 per cent. This machine was installed in the fall of 1923, and has "kept the floor clear," as the shopmen say, ever since.

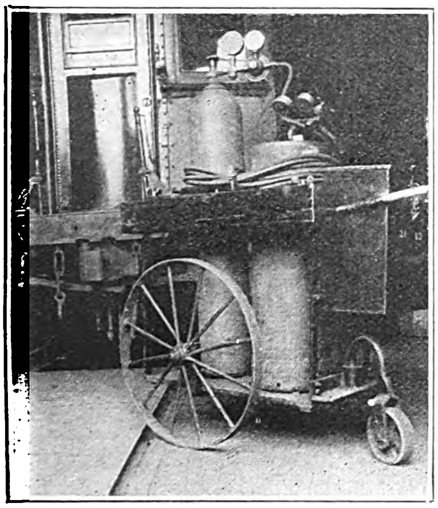
## Oxyacetylene Welding Wagon

The accompanying illustration shows a type of wagon used quite extensively in the Harmon shops of the New York Central Railroad for mounting oxygen and acetylene tanks and carrying the necessary welding equipment for this class of work. The tanks are mounted on a sheet steel platform and the framework required is of strap iron 1½ in. x ¼ in. Rubber mats ⅛ in. thick are installed underneath the tanks and are kept in position by



A High-Speed Drill Used at Atlanta Which Always Keeps Ahead of the Job angle iron brackets at the bottom. A steel top plate is used for keeping the tank in position at the top. The holes through which the tanks pass in this plate are larger than the diameter of the tanks and leather pads are used to fill in the space.

The large wheels for the wagon are 30 in. in diameter and were obtained from discarded hand baggage trucks. A third wheel, 8 in. in diameter, is arranged at one end to swivel and to take the load at that end. There is a pocket the entire length of the framework about 6 in. wide for holding the welding rods and torches. A tool box is constructed on the end of the framework and in this is installed a Pyrene fire extinguisher, a rack for holding various sizes of welding tips and various welding torches. A piece of iron conduit forms the handle. This is welded to the frame and is bent to the necessary shape.


**Convenient Type of Wagon for Oxyacetylene Welding Equipment**

## Charging Pull-Ins Against the Inspector

IN THE shops of the Memphis Street Railway, Memphis, Tenn., each car inspector is required to turn in daily a signed report showing the number of cars he inspected that day and listing the parts examined. A copy of the form used for this purpose is shown in an accompanying illustration. The inspector is then held responsible for the satisfactory performance of these cars.

When a car is pulled in from the road on account of trouble which might have been prevented by proper inspection, the master mechanic looks over the daily reports to de-

## *Dick Prescott Resumes His Work*

### Unaware of Impending Events

THOMAS MULLANEY was standing as Mr. Milburn entered his office. From his attitude and manner, it would have been apparent to a keen observer that the visit of the general manager did not catch him entirely by surprise as it had Steve White, the carpenter foreman, since Steve had called Mullaney's office and informed him of the important visitor who was headed that way.

"Sit down, Mr. Milburn," said Mullaney, as soon as Dick had closed the door. Although this was his first meeting with the new general manager, Mullaney had already acquired a wholesome respect for his ability as an executive. Both through letters and telephone orders and also from opinions expressed by department heads, the feeling had spread throughout the company that here was a boss who knew his business and was accustomed to carrying out his ideas.

An unannounced visit from the general manager, coming out to the shop thus informally and unattended, was new in the long years of Mullaney's experience and was so unlike previous precedent that he could not avoid mentioning the fact.

"This is kind of a little surprise to us, Mr. Milburn. We ain't accustomed to havin' the general manager visit this shop very often."

"Well, I've been trying for several days to get out here to go through the shop with you and this is the first afternoon I've had the opportunity. I want to take a turn through the various departments today to get acquainted, and you may be assured that I shall keep closely in touch with the shop in the future. This is one of the most important spots on the property. You see, you are in a position to make or lose a great deal of money for the road. In addition, you men out here are a vital part of any program of improvement which is undertaken, for without efficient co-operation from this end it will be impossible to maintain the kind of service that I feel this property must give if it is really to fulfill its responsibilities to the car riders."

"Well, we ain't got a great deal out here to talk about, Mr. Milburn. I've been in this shop for well nigh on thirty years and it's always been considered, so far as I could figure out, a kind of necessary nuisance. About the only time we have ever seen the general manager has been when we had to go down to take up demands by the men for more pay."

Mr. Milburn said nothing in reply, but showed by his manner that he was ready to start out into the shop. Thomas Mullaney reached for his old slouch hat and led the way into the outer office.

In the meantime Dick Prescott had returned to the damaged car upon which he had been working as a carpenter's helper, unaware that this little incident would result in opening for him the kind of an opportunity which he earnestly desired.

"Who was the guy that was all dressed up?" said Bill Newman, a carpenter who had grown gray and wrinkled in the Consolidated shop.

"Why, that was Mr. Milburn, the general manager."

"What kind of a guy is he?"

"Oh, he seemed very pleasant indeed."

"Asked a lot of questions, didn't he?"

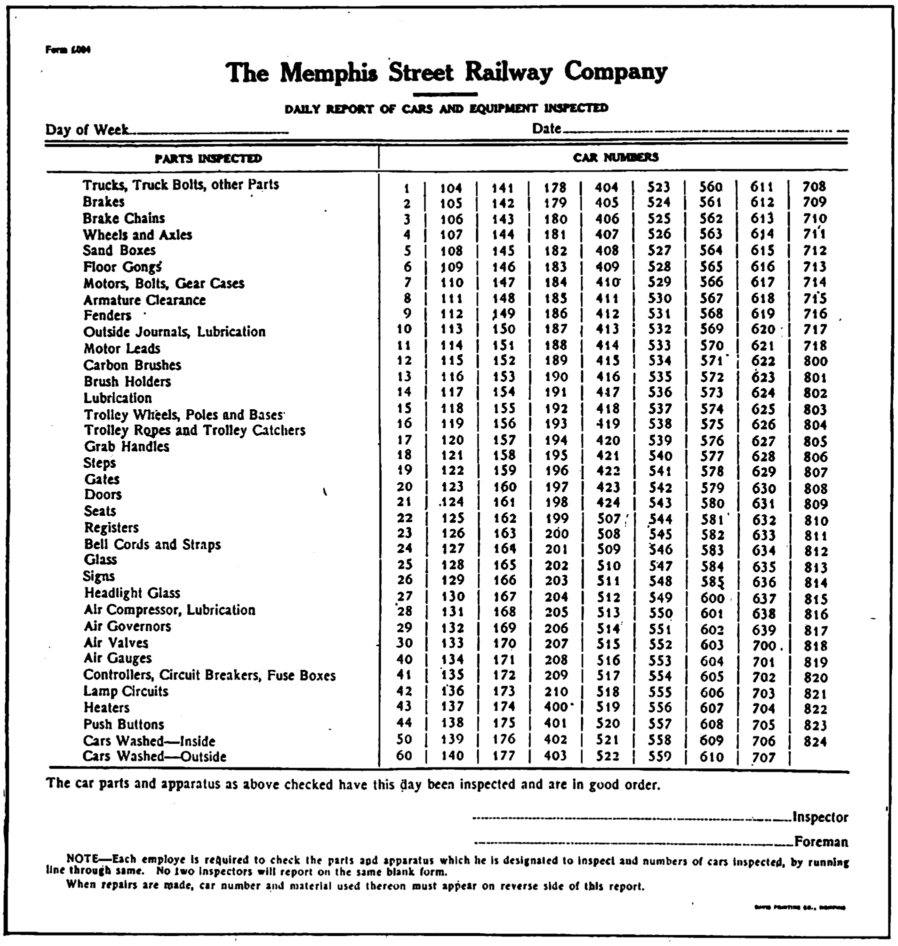
"Yes, quite a number. He was very much interested in many details about the shop."

"Kind of had Steve White flustered for a minute, didn't he?"

"Why, I don't know. I guess Mr. White was surprised to see him."

"Well, that's the kind of a boss I like to have. One who ain't too good to get right out on the job hisself to see what's goin' on. That's the kind of a guy that knows a man by his first name after he's worked in a shop twenty years, like I have. How kin these guys downtown know what this shop needs widout gettin' out here once in a while to see what the joint looks like, eh? I'll bet'cha this fella knows his business, an' if he don't he'll learn pretty quick."

Dick did not need to reply, for Bill, who had just caught sight of the figures of Mullaney and Mr. Milburn entering the carpenter shop door, suddenly became very industrious and discontinued his comments.



Form [illegible]

**The Memphis Street Railway Company**

DAILY REPORT OF CARS AND EQUIPMENT INSPECTED

Day of Week........................ Date........................................

| PARTS INSPECTED | CAR NUMBERS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Trucks, Truck Bolts, other Parts | 1 | 104 | 141 | 178 | 404 | 523 | 560 | 611 | 708 |
| Brakes | 2 | 105 | 142 | 179 | 405 | 524 | 561 | 612 | 709 |
| Brake Chains | 3 | 106 | 143 | 180 | 406 | 525 | 562 | 613 | 710 |
| Wheels and Axles | 4 | 107 | 144 | 181 | 407 | 526 | 563 | 614 | 711 |
| Sand Boxes | 5 | 108 | 145 | 182 | 408 | 527 | 564 | 615 | 712 |
| Floor Gongs | 6 | 109 | 146 | 183 | 409 | 528 | 565 | 616 | 713 |
| Motors, Bolts, Gear Cases | 7 | 110 | 147 | 184 | 410 | 529 | 566 | 617 | 714 |
| Armature Clearance | 8 | 111 | 148 | 185 | 411 | 530 | 567 | 618 | 715 |
| Fenders | 9 | 112 | 149 | 186 | 412 | 531 | 568 | 619 | 716 |
| Outside Journals, Lubrication | 10 | 113 | 150 | 187 | 413 | 532 | 569 | 620 | 717 |
| Motor Leads | 11 | 114 | 151 | 188 | 414 | 533 | 570 | 621 | 718 |
| Carbon Brushes | 12 | 115 | 152 | 189 | 415 | 534 | 571 | 622 | 800 |
| Brush Holders | 13 | 116 | 153 | 190 | 416 | 535 | 572 | 623 | 801 |
| Lubrication | 14 | 117 | 154 | 191 | 417 | 536 | 573 | 624 | 802 |
| Trolley Wheels, Poles and Bases | 15 | 118 | 155 | 192 | 418 | 537 | 574 | 625 | 803 |
| Trolley Ropes and Trolley Catchers | 16 | 119 | 156 | 193 | 419 | 538 | 575 | 626 | 804 |
| Grab Handles | 17 | 120 | 157 | 194 | 420 | 539 | 576 | 627 | 805 |
| Steps | 18 | 121 | 158 | 195 | 421 | 540 | 577 | 628 | 806 |
| Gates | 19 | 122 | 159 | 196 | 422 | 541 | 578 | 629 | 807 |
| Doors | 20 | 123 | 160 | 197 | 423 | 542 | 579 | 630 | 808 |
| Seats | 21 | 124 | 161 | 198 | 424 | 543 | 580 | 631 | 809 |
| Registers | 22 | 125 | 162 | 199 | 507 | 544 | 581 | 632 | 810 |
| Bell Cords and Straps | 23 | 126 | 163 | 200 | 508 | 545 | 582 | 633 | 811 |
| Glass | 24 | 127 | 164 | 201 | 509 | 546 | 583 | 634 | 812 |
| Signs | 25 | 128 | 165 | 202 | 510 | 547 | 584 | 635 | 813 |
| Headlight Glass | 26 | 129 | 166 | 203 | 511 | 548 | 585 | 636 | 814 |
| Air Compressor, Lubrication | 27 | 130 | 167 | 204 | 512 | 549 | 600 | 637 | 815 |
| Air Governors | 28 | 131 | 168 | 205 | 513 | 550 | 601 | 638 | 816 |
| Air Valves | 29 | 132 | 169 | 206 | 514 | 551 | 602 | 639 | 817 |
| Air Gauges | 30 | 133 | 170 | 207 | 515 | 552 | 603 | 700 | 818 |
| Controllers, Circuit Breakers, Fuse Boxes | 40 | 134 | 171 | 208 | 516 | 553 | 604 | 701 | 819 |
| Lamp Circuits | 41 | 135 | 172 | 209 | 517 | 554 | 605 | 702 | 820 |
| Heaters | 42 | 136 | 173 | 210 | 518 | 555 | 606 | 703 | 821 |
| Push Buttons | 43 | 137 | 174 | 400 | 519 | 556 | 607 | 704 | 822 |
| Cars Washed—Inside | 44 | 138 | 175 | 401 | 520 | 557 | 608 | 705 | 823 |
| Cars Washed—Outside | 50 | 139 | 176 | 402 | 521 | 558 | 609 | 706 | 824 |
| | 60 | 140 | 177 | 403 | 522 | 559 | 610 | 707 | |

The car parts and apparatus as above checked have this day been inspected and are in good order.

........................................Inspector

........................................Foreman

NOTE—Each employe is required to check the parts and apparatus which he is designated to inspect and numbers of cars inspected, by running line through same. No two inspectors will report on the same blank form.

When repairs are made, car number and material used thereon must appear on reverse side of this report.

[illegible]

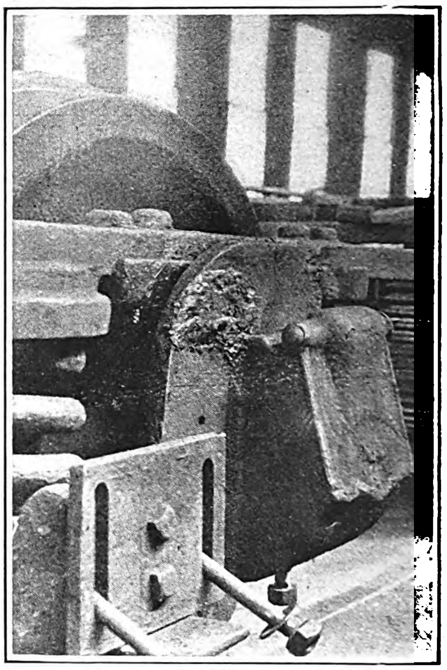
Form Used by Inspectors to Report Numbers of Cars Examined

termine which inspector last examined the car, and charges the failure against him. On a large chart which is posted on the bulletin board in the shop, the number of the cars pulled in are entered under the proper date opposite the name of the inspector responsible. If no cars are pulled in during the course of a month an inspector is credited with 100 per cent efficiency, and 10 per cent is deducted for each pull-in.

This report of the comparative efficiency of inspection was developed in October, 1923, the record for that month being shown in an accompanying table. The charts are posted the first of each month and have created quite a lot of friendly competition among the shop men. For April, 1924, the latest month for which complete records are available, every inspector had a record of 100 per cent efficiency.

## Building Up Worn Equalizing Bars

DUE to the vertical motion of the truck equalizing springs considerable wear takes place on the equalizing bars where they rub against the pedestal. In the truck overhauling program at the shops of the Philadelphia & Western Railway the equalizing bars are taken off and the worn faces built up by electric welding. When the equalizing bars are replaced they are turned around with worn faces outside.



Worn Face of Equalizing Bar Built Up

A spacing block is also set on top of the journal box between the two equalizing bars. This comes between the two pedestal jaws, thus tending to keep the equalizing bars away from the end of the truck pedestal and so reduce the wear.

THE MEMPHIS STREET RAILWAY COMPANY—MONTHLY EFFICIENCY REPORT, DAY AND NIGHT INSPECTORS

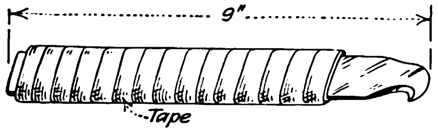
Month of October, 1923

| | | Date | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Per Cent |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Inspector | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Efficiency |
| *Air* | Puryear, R. M. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 100 |
| *Armatures, motor be rings, brush-holders, etc.* | Davis, G. T. | | | | | | | | | | | | | | | | | | | | | | 549 | | | | | | | | | | 90 |
| | Burnette, G. L. | | | | | | | 556 | | | | | | | | | | | | | | | | | | | | 544 | | | | | 80 |
| | Stacks, J. T. | | | | | | | | | | | | | | | | | | 209 | | | | | | | | | | | | | | 90 |
| | Fowler, W. A. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 100 |
| | Palmertree, T. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 100 |
| | Fry, W. R. | | | | | | | | | | | | | 549 | | | | 581 | | | | | | | | | | | | | | | 80 |
| *Brakes* | Gresham, L. D. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 100 |
| | Gresham, E. G. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 100 |
| | Harriman, A. S. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 100 |
| *Car bodies, doors, fenders, etc.* | Hearn, H. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 100 |
| | Hughes, E. H. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 100 |
| | Helms, E. E. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 100 |
| | Murran, Jas. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 100 |
| | Bailey, W. A. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 100 |
| | Reavis, C. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 100 |
| *Electrical equipment* | Yancey, A. T. | | | | | | | | 210 | | | | | | | | | | | | | | | | | | | | | | | | 90 |
| | Spencer, C. C. | | | | | | | | | 571 | | | | | | | | | | | | | | | | | | | | | | | 90 |
| | Hopper, C. E. | | | | | | | | | | | | | | | | | | 552 | | | | | | | | | | | | | | 90 |
| | Murry, F. T. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 100 |
| | Clinton, J. W. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 100 |
| *Journal oiling* | Spraggin, H. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 100 |
| *Trolleys* | Sherwood, L. K. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 100 |

Percentage based on 10 failures.

## Handy Commutator Trimming Knife

After commutator slots have been milled, a burr of copper is left on the edge of each bar. Also, when commutators are turned in a lathe some of the copper is drawn over the edge of the slot, and some who have studied the problem closely believe that the drag of the turning tool tends to "hard draw" the copper at the edge of the slot.



**This Knife Is Used for Trimming the Edges of Commutator Bars**

A simple type of knife, used in the armature room of the Kansas City Railways Company, has been found to be very handy in finishing the edges of the commutator slot after either milling or turning operations. This type of knife is quickly made from a discarded hacksaw blade by grinding the end to the proper shape and covering the remainder of the blade with plenty of tape to form a secure handle, as shown in the accompanying illustration. The knives are made up in pairs; that is, they are ground right and left hand. The hook-shaped cutting edge near the end is dragged along the edge of each slot and quickly trims off the burr so smoothly as to require no sanding of the commutator when the operation is completed.

## Removing Coils from Impregnated Armatures

Where windings have been impregnated or coated with varnish or hydrolene gum, it is sometimes thought that the coils cannot be repaired and that they must be stripped out and the armature entirely rewound. Many windings which have been coated with varnish or filled with certain impregnating compounds can be repaired satisfactorily, however, and some suggestions for removing coils from impregnated armatures are given in an article by J. L. Rylander of the Westinghouse Electric & Manufacturing Company, published in December, 1923, issue of *Electric Journal*. Windings filled with bakelite or cement, however, cannot be repaired satisfactorily.

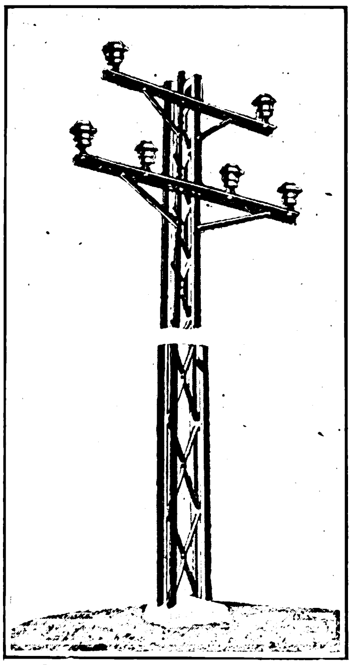
To remove a few coils from varnish treated or impregnated armatures, the slot and end portions of those coils that are to be raised should be covered with a coat of paraffine, about ¼ in. thick. The part of the winding where the coils are to be raised should then be heated. The varnish softens at about 100 deg. C. and loses its sticking quality and the melted paraffine cuts into the varnish sufficiently to act as a lubricant. The best method of heating the armature is in an oven, where the complete winding is heated until the innermost part of the coils and insulation reaches the required temperature. A blow torch can be used if applied with discretion.

In some cases where the varnish has not been sufficiently warmed, the coils will stick to the paper slot liner and in such cases it is advisable to insert a thin knife along both sides of the coil, the full length of the slot between the coil and the paper. This will separate the coil from the paper slot liner. If both the bottom and top coil are inclosed in a paper cell the top coil can be raised easily. The principal thing is to apply plenty of paraffine and heat the whole winding to approximately 100 deg. C.

# New Equipment Available

## Truscon to Make Steel Poles

Announcement has just been made by the Truscon Steel Company, Youngstown, Ohio, that the new steel pole department of that company is now ready for a quantity production schedule and is prepared to manufacture steel poles of all sizes up to 50 ft. in length. The Truscon steel pole is adaptable for use on transmission and distribution lines, telephone, trolley and street lighting systems and for many other purposes.



**Truscon Steel Pole Made from Channel Iron**

A feature of this pole is its simplicity of construction, being pressed from 5-in. to 12-in. steel channels or I-beams. It is so designed that no special equipment is needed by the lineman in ascending or descending, thus eliminating pole steps or the necessity for use of spurred climbers. It is made by pressing a portion of the web of the channel or I-beam out to a predetermined angle, then riveting this pressed-out section to a like section of another channel or I-beam.

Before production was begun and the pole was placed on the market, it was subjected to practical tests under varying conditions over a period of two years. It is claimed by the manufacturers that when this pole is anchored in concrete and painted about once in five years it will last indefinitely. Due to simplification of manufacture and quantity production cost of the steel pole is said to be about the same as that of wood poles; in some sections of the country it is less.

Where more than ordinary strength of pole and extra length is required, the pole can be made in combinations of two or more.

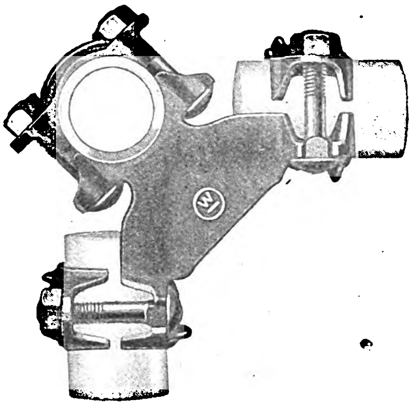
A complete line of fittings has been designed for the steel pole to fit any size standard cross-arm, either wood or steel. The cost of these fittings, which will all be galvanized, is no more than the cost of ordinary through bolts used in general construction work.

The element of public safety has not been overlooked in the design of the copper steel pole. Due to a lack of pole steps and because of the sharp angles formed in joining the riveted web sections, it is impossible for any youngster or other person than a lineman to ascend the pole.

## Interchangeable Pipe Fittings

A LINE of structural pipe fittings for use with common wrought iron or steel pipe in the erection of electrical switching equipment, racks, railings and bench frames has been placed on the market by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

These fittings consist of a relatively few unit castings which may be arranged to produce a large variety of combinations. They are made of malleable iron. The principal feature of the design is a ribbed yoke which clamps over the pipe with carriage bolts to the other unit part. Since the bolt spacings are uniform, parts designed for a certain size pipe are interchangeable with all others for that size. The form of the yoke and other unit parts is such that a considerable area of contact with the pipe is secured. As the fittings are bolted up they yield slightly, due to the malleable characteristics of the iron, until a perfect fit is obtained.



Side Outlet Tee Constructed with Interchangeable Pipe Fittings

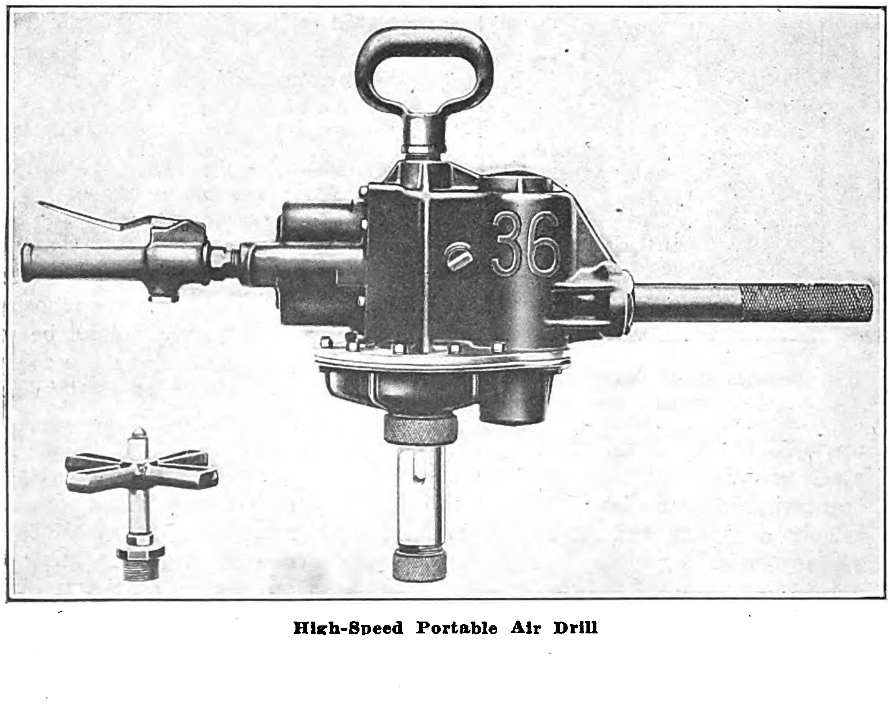
The fittings are designed for two standard pipe sizes, 1½ in. and 2 in., and for combinations of these sizes, with a few fittings of ¾, 1 and 1¼ in. size for light switchboard frames and for clamping insulators to pipe frames. They are furnished in either a black gloss baked finish for indoor use or are galvanized for outdoor installations.

## Portable Air Drill

IN ORDER to meet the demands for a portable air drill for reaming service, the Chicago Pneumatic Tool Company, New York, N. Y., has brought out a new drill designated as No. 36 Red Giant. It weighs 35 lb. Particular attention has been given to provide perfect balance, so that it is easy to handle and control. The spindle is an extension type with a tang slot for convenience in ejecting the reamer or drill.

The cylinders are of the double-acting type, and provided with packing glands which prevent leakage of air into the crank-case. The pistons are turned from special low-carbon steel bars and accurately ground to size. All valves are of the balanced piston type and have no pressure holding them to their seats. As they move but one-twentieth of their length and are devoid of rocker arms and gears, they require very little power for operation. The valves are located between the cylinders with very short ports, thus providing air control close to the cylinders and effecting economy in the use of air.

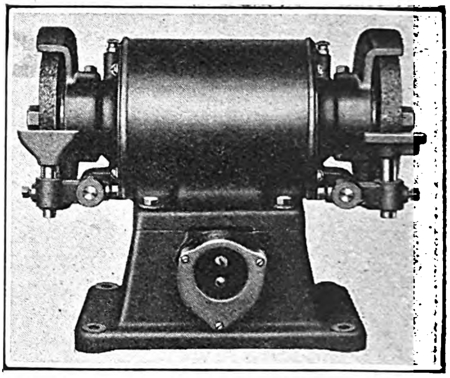
The crankshaft is forged from high grade nickel steel, heat-treated to give high tensile strength in the throws and hardness at the wearing points. It is mounted on three ball bearings, the extra one insuring proper shaft support on both sides of the main drive gear and reducing friction. Splash lubrication is used and as there is no air to bleed from the crank chamber, no lubricant is carried out with the escaping air and lost.



High-Speed Portable Air Drill

## Six-Inch Bench Grinder

A NEW bench grinder of small size has been brought out by the Hisey-Wolf Machine Company, Cincinnati, Ohio. The grinding wheels are fitted directly on the spindle, and the grinding rests are adjustable and can be removed if desired. Two grinding wheels 6 in. in diameter are used and the height of the grinder from the bottom of the base to the center of the spindle is 8 in. The grinder weighs 70 lb.



Small Grinder for Very Light Grinding

Ball bearings completely inclosed from dust and grit are provided with heavy felt protector washers on each side of the bearing housing. The grinder is driven by a ¼-hp. motor, and a motor switch is conveniently mounted and protected in the base. The switch is equipped with thermostatic control which provides the same characteristics as a fuse, and gives maximum protection to the motor. Safety combination wheel guards as shown in the illustration can be supplied if desired. This guard is adjustable to any angle and can be moved back as the grinding wheel wears, thereby giving full access to the grinding wheel with maximum guard protection. It is interchangeable with the standard open-end guard.

# Association News & Discussions

## Canadians Hold Successful Convention

### Rail Joints, Operating Problems, Traffic Congestion and Safety Were Main Topics at the Ottawa Meeting, Which Was Held Jointly with the Canadian Electrical Association—Exhibits Attracted Attention

THE Canadian Electric Railway Association and the Canadian Electrical Association combined this year to hold their annual conventions at Ottawa, June 11 to 13. The entertainment features and the exhibits were held in common, while the sessions of the two associations were conducted independently. The total attendance at the convention was about 400, of which nearly half were railway men.

On account of the resignation of President H. H. Couzens of the railway association, who has gone to Rio de Janeiro within the last month to become vice-president of the subsidiaries of the Brazilian Traction, Light & Power Company, the meetings of the electric railway association were presided over by D. E. Blair, its vice-president and superintendent of rolling stock Montreal Tramways.

The secretary in his annual report stated that there are now 35 member companies which operate 87 per cent of the trackage in Canada and 93 per cent of the equipment. In addition there are 31 associate members who are manufacturers of electric railway equipment.

### SAFETY COMMITTEE REPORT

The safety committee, W. R. Robertson, general superintendent Hydro-Electric Railways, chairman, presented an elaborate report on safety work in Canada. A number of plans were advocated to insure greater safety of street railway operation. One that was particularly stressed was the inauguration of the so-called boulevard stop, where the street with car tracks is considered a main thoroughfare and vehicles approaching on intersecting streets are required to make a safety stop before crossing. This system, according to the report, does not affect the street railway so much as it helps the automobiles, as those running on the main streets so designated are able to proceed without delay at the crossings, while those approaching have greater safety.

In Toronto it was found that 53 per cent of the automobile accidents occur when vehicles turn out from the parking space without warning, and only 3 per cent are at intersections. Automobiles running into cars furnish 35 per cent of the accidents.

In the discussion J. F. H. Wyse, manager Ontario Safety League, contended that the greatest thing to reduce accidents is to obtain legislation requiring each automobile or truck driver to secure an individual license. C. L. Wilson, Toronto, suggested that a physical examination, including eyesight, should be a prerequisite to obtain such a license. C. B. King, London, Ont., urged uniform reporting of accidents throughout Canada in order that they might be studied and the proper remedies worked out.

Mr. Robertson stated that on his road reports are prepared of all accidents, which are used as a basis for the preparation of charts. Copies of these charts are posted in the trainmen's rooms and others are given the municipalities for the use of the police departments. He thinks that this publicity for the accident records has been instrumental in the campaign for the establishment of boulevard stops on his lines. Mr. Blair thinks that in order to get uniform reports of accidents, blanks should be prepared for the use of all railways.

I. S. Fairty, Toronto, stated that he was opposed to too many boulevard stops or similar restrictions. He also opposes licenses for motorists. Street cars should be given the right-of-way over vehicles he said.

The standards committee, D. E. Blair chairman, reported on the progress of electric railway standardization in Canada, and the co-operation between this association and other bodies in the United States and Canada.

### VALUATION AND DEPRECIATION

The committee on valuation and depreciation, H. E. Weyman, general manager Levis County Railway, chairman, presented a report recommending the Interstate Commerce Commission standard classification of accounts for electric railways, including the sub-accounts covering motor vehicle operation as adopted at the 1924 convention of the American Electric Railway Accountants' Association.

On the subject of depreciation the committee stated that there are numerous features to be given consideration in connection with the depreciation of electric railway accounts. Two classifications of depreciable property are recognized: Property that must be replaced in the form of individual units, such as cars, buildings, etc., and property whose replacement is a more or less continous process, such as track. The straight-line method of figuring depreciation charges was recommended, and it was recommended that a minimum cost figure should be set below which the book value of the part should not be depreciated. Obsolescence was considered separately from true depreciation, and it was the sense of the committee that this item might well be amortized in future years, since the replacement of the part was on account of the more efficient or more satisfactory service to be rendered by the new part.

### TRACK WELDING DISCUSSED

A paper was read by A. T. Spencer, Toronto, describing the results obtained from welding of track joints on the lines of the Toronto Transportation Commission. His paper is abstracted elsewhere in this issue. A lively discussion followed, which was taken part in by many of the members. J. B. Tinnon, Metal and Thermit Company, New York, emphasized the necessity of watching the joints and taking care of them before the development of serious trouble. He spoke briefly of the tests now being made under the auspicies of the American Electric Railway Engineering Association way committee.

Attention was called to the lack of unanimity of opinion of way engineers regarding methods for seam welding joints by E. B. Entwisle, Lorain Steel Company, Johnstown, Pa. He recommended post-heating of any type of joint to anneal the metal. R. M. Dominey, Windsor, who has used both carbon and metallic arc welding, gave some of his experiences in track welding. C. B. King, London, Ont., stressed the necessity of making a continuous rail. He described experiments he had made using base plates, but with steel rods welded to the web of the rail in place of joint plates. By filling the gap between the rail ends an arch effect is produced, he stated, that makes the joint rigid. Mr. Tinnon called attention to the difficulty with deposited metal of getting the same composition to fill such a gap as there is in the body of the rail. A special form of joint plate is preferred by H. E. Weyman, Levis, Que., for use with old rail in order to get the correct alignment of the butting rails.

Mr. Blair spoke of the welding of the 60-lb. or 70-lb. A.S.C.E. section rail in Montreal in 1918, which was done with the carbon arc process with loosely fitted joint plates and base plates, seam welded. This type of joint has been found very satisfactory in practice, not a break having occurred on some 2½ miles of track.

Questioned regarding expansion joints, Mr. Spencer stated that in Toronto he has left an open joint for expansion about every 1,500 ft. of straight track. Special work and curves are not welded. He also stated that he has had some measure of success in the welding of manganese steel.

A paper was read by A. H. Foster,

Brantford, describing some of the problems of street railway operation in a medium sized city. This paper is abstracted elsewhere in this issue. Discussing the paper, Mr. Robertson mentioned the combination of pay-as-you-enter fare collection inbound combined with pay-as-you-leave outbound as a method of simplifying operation and reducing congestion. He also called attention to the advantages of cars designed for modern operation, mentioning the new car designed for the Hydro-Electric Railways. This car, weighing about 26,000 lb., has an energy consumption of about 1.4 kw.-hr. per car-mile.

R. M. Reade, Quebec, stated that for the assistance of one-man operators he has put tickets on sale at various agencies, such as cigar stores. These tickets are sold outright to the agencies in bulk at a discount of 5 per cent, so that no risk is involved to the railway. With this assistance in fare collection the one-man cars have been able to make the same speed as two-man cars.

Mr. Weyman feels that the logical cash fare is 10 cents, with reduced rate tickets arranged to take care of any reductions that are desirable. On his line these are now selling at four for 30 cents. This rate, he said, is not liked by the public, the men or the company. He feels that tickets should be sold in such units as can be handled easily, such as 25 cents or 50 cents. The 10-cent fare does not affect the regular rider, who uses tickets exclusively. Fares are accounted for by means of registers, and the register reading must agree with the fare box collections within 4 per cent. If the discrepancy is greater than that the operator must return the difference.

To cut down service loses traffic, according to Mr. Weyman. Of the total operating expenses, 70 per cent are fixed when one-man cars are used, regardless of the number of cars actually in service, up to the limit of the number owned. On a small property the car-mile is not a reliable basis for comparison on account of the large proportion of the charges which are fixed in amount.

His road formerly purchased several types of second hand cars from time to time. The amount of repair stock it was necessary to keep on hand was very great. Fortunately a fire enabled him to standardize on new equipment, so that he has been able to introduce operating economies and reduce the amount of stock.

Leonard Tait, London, Ont., stated that his company has discarded the register and is weighing the tickets instead of counting them.

H. K. McLean, St. John, N. B., gave his experience with the weekly pass, which he thinks has increased the riding in St. John. This pass is sold on Mondays for $1, and is good for the week. Tickets also are sold at the rates of three for 25 cents, or 14 for $1. The receipts are now running about 10 per cent cash, 14 per cent tickets, and the remainder are riders on the passes.

Mr. Robertson stated that he is not using a register, and also is weighing the tickets instead of counting them. For the conductors' returns he has designed a special safe which is installed in the partition between the conductors' room and the accounting office. It has 24 separate compartments, one being assigned to each conductor. The conductor's turn-in is placed in one of the compartments, which is then closed and locked automatically. It can be opened by means of a combination in the accounting office, the contents removed and the outer door reset.

In Ottawa the paving charges are assessed against the property owners, according to Major F. D. Burpee. This has been found very desirable in the business district, as the stores are benefited by the presence of the street railway. In the residence districts the advantage to the property owner is not so obvious.

The reports on motor vehicle operation and on valuation and depreciation were carried over for another year.

### THE NEW OFFICERS

The following officers were elected for the ensuing year:

Honorary president, Lt.-Col. J. E. Hutcheson, general manager Montreal Tramways.

Honorary vice-president, Acton Burrows, proprietor *Canadian Railway* and *Marine World.*

Honorary advisory council: T. Ahearn, Ottawa; F. A. Gaby, Toronto; S. J. Hungerford, Montreal; George Kidd, Vancouver.

President, D. E. Blair, superintendent of rolling stock Montreal Tramways.

Vice-president, W. S. Hart, treasurer Quebec Railway, Light, Heat & Power Company and vice-president Three Rivers Traction Company.

Treasurer, E. P. Coleman, general manager Dominion Power & Transmission Company.

Auditor, C. B. King, manager London Street Railway.

Executive committee: The president, the vice-president, the treasurer, the immediate past-president (F. D. Burpee, Ottawa) and A. H. Foster, Brantford; G. Gordon Gale, Hull; D. W. Harvey, Toronto; D. W. Houston, Regina; M. W. Kirkwood, Galt, Ont.; A. W. McLimont, Winnipeg; M. A. Pooler, St. John, N. B.; W. R. Robertson, Toronto; H. E. Weyman, Levis; C. L. Wilson, Toronto.

### JOINT LUNCHEONS HELD WITH ELECTRICAL ASSOCIATION

At the joint luncheons, which were held Wednesday, Thursday and Friday, a series of talks of interest both to the railway men and the electrical men were given. The first luncheon was presided over by G. Gordon Gale, vice-president Hull Electric Company. He introduced Mayor Napoleon Champagne of Ottawa, who gave an address of welcome. Following this there was a witty talk by Col. H. C. Osborne, who paid a striking tribute to the services of the engineers in the improvements that have been effected in the utility field through their efforts.

The Thursday luncheon was presided over jointly by P. T. Davies, president Canadian Electrical Association, and Mr. Blair. The speakers were H. T. Sands, vice-president National Electric Light Association, who spoke on public relations, and James W. Welsh, executive secretary American Electric Railway Association, who pointed out that traffic congestion in the larger cities is the greatest obstacle to street transportation. The electric railway industry must not be stampeded by the motor bus, he said, but must make public transportation more popular and private transportation less so by comparison. The electric railway should be the carrier of the people, and should keep a firm hold on the transportation business.

On Friday the speakers at the luncheon were George Oxley of the National Electric Light Association and Morris Buck, associate editor ELECTRIC RAILWAY JOURNAL. Mr. Buck spoke of the campaign of modernization which is now well under way in the United States and the work being done along these lines by the American Electric Railway Association and the technical press.

Thursday evening the delegates were guests at a dinner held at the Chaudiere Golf Club. The toast to the King was proposed by the joint toastmasters, Messrs. Blair and Davies, and responded to by the entire assemblage. Following this was a toast to "Our Guests," proposed by Major Burpee and responded to by the Hon. George P. Graham and P. D. Zimmerman of the N.E.L.A. "The Ladies" was proposed by Mr. Blair and responded to by Don M. Campbell. The final toast, "The Technical Press," was proposed by Col. D. R. Street and responded to by Acton Burrows, *Canadian Railway and Marine World,* and Dr. Walter Carr, *Electrical News.*

### EXHIBITS A FEATURE

The exhibits this year were if anything better than those at the convention last year. Every space was filled and there were several outdoor exhibits of buses and the new one-man car of the Hydro-Electric Railways built by the Ottawa Car Manufacturing Company.

Among the exhibitors were: Don M. Campbell, Preston, Ont.; Canada Street Car Advertising Company, Montreal; Canadian Car and Foundry Company, Montreal; Canadian Cleveland Fare Box Company, Preston, Ont.; Canadian General Electric Company, Toronto; Canadian National Carbon Company, Toronto; Canadian National Safety League, Toronto; Canadian Porcelain Company, Hamilton, Ont.; *Canadian Railway and Marine World,* Toronto; Canadian Steel Foundries, Montreal; Canadian Westinghouse Company, Hamilton, Ont.; Cheatham Electric Switching Device Company, Louisville, Ky.; Crouse-Hinds Company of Canada, Toronto; Differential Car Company, Findlay, Ohio; Dominion Insulator & Manufacturing Company, Toronto; W. L. Donnelly, Ottawa; Economy Electric Devices Company, Chicago, Ill.; ELECTRIC RAILWAY JOURNAL, New York; *Electric Traction,* Chicago, Ill.; *Electrical News,* Toronto; *Electrical World,* New York; Ferranti Meter & Transformer Company, Toronto; Galena Signal Oil Company, Toronto; Inventions, Limited, Montreal; Lincoln Meter Company, Toronto; Lyman Tube & Supply Company, Montreal; Metal & Thermit Corporation, Toronto; Nachod Signal Company, Louisville, Ky.; Northern Electric Company, Ottawa; Ottawa Car Manufacturing Company, Ottawa; Railway & Power Engineering Corporation, Toronto; Reo Motors (Capital Motors), Ottawa; Sangamo Electric Company, Toronto; Sarnia Bridge Company, Sarnia, Ont.; the N. Slater Company, Hamilton, Ont.; Southam Press, Montreal; Spielman Agencies, Montreal; United States Steel Products Company, Montreal; the White Company, Toronto.

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# Welded Rail Joint Practice in Toronto*

## How the Transportation Commission Has Welded 17,500 Joints in Two Seasons of Track Construction

BY A. T. SPENCER
Assistant to General Manager Toronto Transportation Commission

SINCE 1921 there have been welded on the tracks of the Toronto Transportation Commission about 17,500 joints, of which about 11,000 were in connection with new track construction and 6,500 in reclaiming joints on track which has been in service a number of years. The work done covers joints on 122-lb. grooved girder rail, 90-lb. grooved girder rail, 80-lb., 7-in. high T-rail and 100-lb. A.R.A. type "A" T-rail. Of the 11,000 joints welded on new work there have been no failures. Five or six joints, where old standard plates were used on old track, have failed. No failures have occurred on old track where new plates have been used.

Because of the amount of track rehabilitation and extensions which was done in 1921-22, the equipment owned by the commission is, of course, much more extensive than would normally be the case. It consists of:

1. Six machines of the dynamotor type mounted on road wheels. These are used chiefly for joint welding with the carbon arc.
2. Three metallic arc machines used chiefly for welding steel bond terminals. A very successful job of joint welding can be made with these machines, though the speed of welding is considerably lower than with the carbon arc. Tests carried out at the University of Toronto showed that as far as conductivity and strength were concerned the metallic arc produced just as strong a joint as the carbon arc.
3. One Burke welding outfit consisting of a Burke welding machine mounted on an old single-truck passenger car. It is of the dynamotor type and is connected for two operators. It is used chiefly for building up special track and cupped rail joints at night.

Five kinds of welding rods are commonly used, as follows:

1. 5/32-in. diameter bare low carbon rod with carbon content of 0.16 per cent used in metallic arc welding of drain plates, joint plates and building up cupped rail.
2. 5/32-in. diameter bare high carbon rod with carbon content of 0.58 per cent used for metallic arc welding of cupped and worn rails.
3. 5/32-in. diameter flux coated, low carbon rod with carbon content of 0.28 per cent used for metallic arc welding of steel terminal bonds.
4. 9/32-in. diameter bare low carbon rod, with carbon content about 0.10 per cent. These are standard electrodes for joint welding with the carbon arc and are also used in welding track drain plates and heavy welding repairs to steel castings or forgings.
5. 3/16-in. diameter coated manganese rod, known as Wanamaker rod, manganese content of about 14 per cent, used for repairing and building up manganese special track work.

In all welding, with the exception of building up manganese steel special work, the rail is positive.

The joint plates used in most cases have been 24 in. long of 7/8-in. mild steel, with carbon content of 0.25 per cent to 0.35 per cent, and are planed to fit accurately the fishing surfaces of the rail section. Four bolt holes are punched, this operation being done before the plates are planed, as otherwise humped joints or concave joints will result because of uneven fishing surfaces.

It is generally accepted that welding to the base of the rail should not be done where the base is less than 3/8 in. thick. In 1923 a number of joints were installed, using a 1 1/8-in. plate with the base chamfered so that the base weld would be set inward to where the rail base was the required thickness. Angle bar plates and continuous joint plates have also been used with good success by shearing off the base of the plate, but the writer believes that new planed plates will give the best results.

Considerable argument has arisen regarding the length of weld required and its location on the seams in order to give the strongest and most satisfactory joint. As this is now one of the matters under test, the writer will not express an opinion except to say that tests made in Toronto indicate that, in order to produce 100 per cent conductivity in the 122-lb. rail section, it is required to have four seams of from 20 to 22 in. long.

It is considered important that the welding on opposite seams should not end or begin opposite each other.

The use of the defining bar was discarded after a sufficient number of operators had been thoroughly trained. The hand-feed method is used, whereby the operator controls the arc with the welding handle in his right hand and feeds in the welding rod with the left hand. This was found to be the most satisfactory method both as to speed and quality of the weld.

In laying the track, the track gang is responsible that the fishing surfaces of both rail and plates are clean and free from rust before being bolted up, and the track at the joint is properly lined and surfaced before the welders begin work. The plates are drawn up tightly with four bolts and the welders are instructed not to begin their work if the joint is not correct as to line and surface. The joint surfaces will not always be found to be correct. Where the surface is good the order of welding is as follows: (1) Inside bottom seam; (2) outside bottom seam; (3) inside top seam; (4) outside top seam.

On concave joints the above order is followed, but the two top seams are tacked with spot welds each side of the rail joint after the bottom seams are welded. If the joint is found to be slightly convex, or where the surface is good but the rail noticeably undercut, the order is changed and work done as follows: (1) Outside top seam; (2) inside top seam; (3) outside bottom seam; (4) inside bottom seam.

Using from 175 to 200 amp. at 50 volts, the penetration secured is about 1/8 in. deep in plate and rail. By holding this current the welds obtained have proved stronger and more ductile than welds made with a higher current and deeper penetration.

The speed of welding is about 2 in. of seam per minute. On an average the speed secured over a day, including moving of machines and incidental details, is one to one and a quarter joints per hour.

After welding, the seams are brushed and the whole joint painted, after it has cooled, with water-proof black paint to prevent corrosion of the welded metal.

It is important that the rail surfaces at the joints be ground as soon as possible after welding and before car service is operated.

The allowable variation in rolling rail section at the mill is such that seldom will two new rails match perfectly. Sometimes even after rails are carefully ground to a true surface, car traffic will show that the work has not been done properly.

The writer believes that no type of welding or mechanical joint under service will insure entire freedom from cupping and that all types of joints must be watched. Should the receiving rail show signs of polishing it is almost certain that cupping will occur later, which, if not attended to in the early stage, may develop serious failure of the joint.

The writer also believes it is too often assumed, when a series of joints is completed, that all can be forgotten for some time, and he knows of no better example of when "a stitch in time can save nine" than in the careful watching and, when necessary, the giving of slight grinding attention to a polished receiving rail at the joint.

Regarding costs of seam-welded joints, it will be found that in the type of joint above described about 2 lb. of welding rod will be used per joint and that, including this and covering a series of joints, the cost of each, exclusive of plates, will average about $1.80 per joint, including moving of machines and delays, with operator's wages at 65 cents per hour.

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*Abstract of a paper at the convention of the Canadian Electric Railway Association, Ottawa, June 11-13, 1924.

In none of the joint welding done in Toronto has the rail been preheated before welding. It is interesting to note in connection with one set of joints sent to Washington for test by the American Bureau of Welding—and which was preheated before welding—that when subjected to the bending tests the joint apparently could not be completely destroyed, though perhaps in other respects it did not show up any better than other types of joints.

# Problems of a Railway in a Medium Sized City*

## Some of the Essentials that Will Help Make for Successful Operation in the Face of High Costs—Inducing the Public to Ride

BY A. H. FOSTER
Manager Brantford Municipal Railway,
Brantford, Ont.

THE small roads must look upon the large ones as their big brothers, and religiously consult the technical journals and railway associations for information concerning improved practices if they wish to run their properties as they should be run. I do not mean that all the good ideas emanate from the large properties, as I believe that as much adaptability and resourcefulness exist on the smaller roads.

Much depends on a proper roadbed. It is the first step in good railway operation. It will permit of higher car speed, lower maintenance costs to both track and rolling stock, smoothness and comfort in riding. I do not mean that it is necessary to indulge in the more expensive classes of construction or the heavy section rails now available, but I do mean the track construction should follow the best accepted practices, such as will fit the purse of the railway and meet the requirements of the rolling stock and possible volume of traffic. While there is much diversity of opinion as to the desirability of steel ties and monolithic construction in trackwork, I think the smaller roads, particularly, when required to lay permanent pavements will secure good results by the use of this type of construction. Some of the steel ties on the market secure their bearing practically under the base of the rail and for this reason will reduce the initial cost by thousands of dollars per mile over other classes of construction on account of the reduction in the amount of excavation and concrete required.

Under most conditions an 80-lb. rail is ample, an A.S.C.E. section for gravel or ballast construction and a high section rail for paved or permanent roadway construction. In most of our roads the wear on the rail itself has in the past not been the determining factor in the life of the track, but rather joint conditions have been the cause of failure. For this reason rails with a length of 62 ft. should be used, the extra cost over the shorter lengths being offset to a great extent by the reduction in the cost of splice bars, bolts, bonds, welding, etc.

A large part of track troubles are due to joint conditions. No reasonable expense should be spared and close attention should be given to this important item of track construction and maintenance. Most of the trouble originates in the loosening of the bolts in the splice bars, caused by improper fitting of the plates or perhaps by failure of the bolts themselves. There can now be purchased in Canada or the United States heat-treated bolts with tensile strength and elastic limit nearly double those of the ordinary low carbon bolt, and they should be used exclusively for railway work.

The electric welding of joints is now past the experimental stage and will prevent to a great extent the troubles usually met with. I think that no road is so small that the use of this type of rail jointing cannot be justified. Rail joints should also be ground so as to present an absolutely true running surface, which will prevent the battering and cupping of rail ends.

Curves are often laid by rule of thumb and to the requirements of gage only. This is a mistake, as much discomfort in travel, damage to rolling stock, and slowness of car movement can be avoided by properly laid out and spiraled curves.

Where car routes diverge, we have installed electric switches, and spring switches have been installed at turnouts so that our operators are not required to stop or leave the car. There has always been a dislike on the part of carmen to either stopping their cars to get out to turn switches, particularly if weather conditions are bad, or performing contortions with a switch rod through a hole in the floor.

While steel poles may be desirable, their cost usually prohibits their use except in the business sections. In Brantford we install cedar poles slightly longer than are actually required by the railway, leaving the upper portion available for our power and lighting utilities, which pay for this privilege.

### TRAFFIC CONDITIONS AND REQUIREMENTS

In the smaller cities, street car riding may be in part due to necessity, but usually it is one of convenience and habit. All railways must cater to the short-haul rider, but the small properties almost entirely on this class of business. In most cities of say 50,000 population or under, a more frequent service is usually provided than can be justified by the traffic. Regularity is essential or otherwise patrons will walk.

It is not always possible to increase the average speed of our cars in keeping with the less congested thoroughfares encountered in the smaller cities, many of which give a 10-minute, or less frequent, service. This is caused by a variety of reasons. Stopping places have to be established at frequent intervals to encourage and accommodate short-haul passengers. Usually there exist considerable stretches of single track, operated with turnouts, making the movement of one car dependent on that of another. On account of the comparatively infrequent service it is necessary to establish transfer points where positive connections must be made.

A regular and easily remembered schedule is more efficient than an irregular one, although with closer headways. In other words a 10-minute service to meet all conditions is more profitable than a 9-minute or even an 8-minute schedule that might vary from time to time.

### ONE-MAN CARS A NECESSITY

In the class of cities I am referring to a service with reasonable headways can best be rendered by means of light-weight one-man cars. I am of the opinion that any conditions that permit of the use of small light-weight cars also will permit of one-man operation.

As to the safety of one-man car operation, during the past year, with an operation of more than half a million car-miles, we did not pay one cent for personal injuries and less than $100 for damage or collision claims.

### TICKET FARES DESIRABLE

On the rate of fare depends to a considerable extent the volume of business, and hence the amount of revenue. In the smaller cities there are greater limitations as to the amount which can be charged, as riding is not a necessity to a large percentage of the population. As a comparison in regard to the riding habit, the following figures are given:

| City | Population | Revenue Passengers per Capita per Annum |
|---|---|---|
| Cornwall .......... | 7,382 | 88.0 |
| Sarnia ............ | 14,637 | 79.0 |
| Guelph ............ | 18,019 | 72.7 |
| Kingston ........... | 23,954 | 36.8 |
| Kitchener and Waterloo ............ | 27,491 | 93.5 |
| Brantford .......... | 29,395 | 109.3 |
| London .......... | 59,100 | 212.3 |
| Hamilton .......... | 108,143 | 177.2 |
| Providence .......... | 237,595 | 227.0 |
| Indianapolis ........ | 314,194 | 272.0 |
| Toronto ............ | 538,771 | 354.0 |
| Cleveland .......... | 796,836 | 367.0 |

In this section of the country a 6-cent fare is about the limit that can be charged, as a larger fare would result in a reduction of traffic sufficient to offset the increased revenue from the larger rate. In Brantford, where a 6-cent cash fare is charged, more than 75 per cent of our riders use tickets, which may be purchased in multiples of 10 at the 5-cent rate, and we find that only transients or casual riders pay the cash fare. The benefits of tickets we believe are considerable, as persons in possession of tickets already paid for will ride much more frequently than the cash rider. Particularly in one-man car operation the use of tickets is desirable as it facilitates the work of the operator, who is required to make a money transaction for only every 10 rides or more.

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*Abstract of a paper at the convention of the Canadian Electric Railway Association, Ottawa, June 11-13, 1924.

### Delays Occasioned by Making Change

Even with a small ratio of cash riders, we considered the delay in making change of sufficient importance to give some thought to the matter, and if possible reduce the delay to a minimum. A 6 or 7-cent fare required that in making change five coppers were always necessary and we felt that any method that would lessen the operation of counting these five coins would be a step in the right direction. We found that there were on the market certain types of what have been termed "high-speed changers," that are inexpensive, light, portable and accurate and that any required number of certain coins could be ejected by a single operation without actual count and which could be adjusted to meet any usual requirements.

### Equipment Maintenance a Serious Problem

Maintenance is a serious problem on a small road. With the large variety of work to be done, the volume does not permit of the employment of men whose duties are confined to one or two operations, but rather these men must be familiar with, and perform more or less individually, many classes of repair and maintenance work.

Usually the smaller the road the less spare rolling stock is available, and crippled cars must be placed back into service in the minimum time. To accomplish this, shop equipment must be chosen carefully, and although a large variety may not be justified, every shop should have at least a fair-sized lathe, a good drill, power hacksaw, shaper, pipe and bolt-threading machine, grinders, pit pump, blacksmith shop and crane, as even with local machine shops available for repairs, the cost and delay in getting work done prohibit their use to a great extent.

In the small shop many hundreds of dollars may be thrown away via the scrap pile, on account of the inability to repair broken or worn material. I know of no equipment that will assist more in lessening this waste than an oxyacetylene cutting and welding outfit and an electric welder suitable for shop and track use.

In certain cases, co-operation between railways not too widely separated as to distance will prove to be of value. I have in mind the Brantford and the Kitchener street railways, neither of whose operations would perhaps permit of the purchase of portable crossovers, so it was decided that one property would buy a left-hand and the other the right-hand turnout, and that work being done that would require their use should be laid out so as not to conflict.

Careful watching of the stores will result in appreciable savings for any electric railway. Usually the small or medium-sized roads have a comparatively large variety of rolling stock. Car purchases are made infrequently and standardization is sacrificed by the railway for the newer types of equipment. Frequently second-hand cars may be purchased with cheapness as the main consideration. A comparatively large variety of repair parts must be kept on hand and stocks must be kept at a minimum so as to not tie up a considerable amount of money, and that in the event of discarding or scrapping equipment, large losses will not be incurred by disposing of store supplies. Properties with much of the older styles of equipment find that in the event of materials on hand becoming exhausted great delay will be experienced in deliveries with attendant inconvenience.

As a general remark in closing, I would say that no efforts should be spared to have neat, well-informed, and courteous car operators, and clean, well-ventilated and well-heated cars if the good will of the public is to be retained, which is absolutely necessary if the railway is to be a success.

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# Midwest Association Has Lively Convention

## Transportation Salesmanship, Taxation, Bus Operation and Traffic Problems Were Topics of a Well-Balanced Program of General Interest—Courage and Co-operation Urged by Railway Commissioner

"ANYTHING is possible when we have to do it. And your industry has reached the crisis in its career when the 'must' of the situation has become the dominant note. The public, whether it realizes it or not, must have street car service. It must be educated to that fact. You who are in the business must find ways and means of giving that service. . . . That genius for overcoming obstacles that has been a characteristic of American progress will find a way in your industry."

In these words, H. G. Taylor, member of the Nebraska State Railway Commission, and president of the National Association of Railway and Utility Commissioners, voiced the spirit that must dominate the thinking of the railway executive of the day. The statement was made in his address, printed elsewhere in this issue, delivered at the banquet concluding the first annual meeting of the Midwest Electric Railway Association, held in Omaha, Neb., on June 11 and 12.

Commissioner Taylor's address was a fitting climax to a meeting punctuated throughout by positive and progressive statements. In a paper presented at the first day's session F. G. Buffe, general manager for the receivers, Kansas City Railways, expressed the modern railway executive's creed of continuous and uninterrupted service. His paper is abstracted elsewhere in this issue. As a result of this same attitude manifested throughout the meeting, a spirit of optimism permeated all of the discussion.

Mayor J. C. Dahlman of Omaha welcomed the members of the association to the city on Wednesday morning. He said that transportation is one of the most important problems of the cities and the entire country and that faith, sound judgment and determination were required to cope with it.

### St. Louis Traffic Problems

Taking "Traffic and Congestion" as his topic, R. J. Lockwood, assistant manager for the receiver, United Railways of St. Louis, described some of the traffic problems and the work for the relief of street congestion that has been done in that city. He pointed out the advantages to the riding public and to the railway of the widening of Twelfth Boulevard, which has permitted a track relocation eliminating six right angles and five blocks of route. The new traffic ordinance passed there last March confers on the traffic council power to regulate parking, establish safety zones, and to control traffic.

To give an idea of the St. Louis problem, Mr. Lockwood pointed out that the city proper has an area of 61.4 square miles, with 950 miles of streets. The population is 803,000, and St. Louis County has an additional population of 107,000, mostly adjacent to and commercially a part of the city. The towns in Illinois just across the Mississippi, with some 91,000 people, make a total metropolitan population of about a million people. Street railway service in the city and county is furnished by the United Railways, which has 37 car routes covering 483 miles of tracks. It operates daily 1,412 cars and handles a million and a quarter total passengers.

The principal traffic problem in St. Louis, said the speaker, is in the central business district, about one-half mile square. The streets in this area have roadways of 30, 36 and 50 ft., only three being of the latter width.

The population within the corporate limits of the city has increased approximately 40 per cent in 23 years, while the street car traffic has increased 109 per cent in the same period. As 80 per cent of all street cars terminate or pass through the congested district, an idea of the effect of increased street car travel on the traffic may be gathered.

The recent and acute factor in traffic congestion is the automobile. In 1917 there were 24,301 licensed automobiles in St. Louis; in 1918, 27,496; in 1919, 37,414; in 1920, 53,230; in 1921, 69,433, and in 1923 slightly more than 120,000. This is an increase in six years of approximately 400 per cent. Now there is an automobile for every 6⅔ people, as compared with one for every 30⅔ in 1917.

Another recent addition to traffic congestion is the bus, of which 72 are operating at present on four routes aggregating 20 street miles. About 80 per cent of this is on streets with street cars, and all four routes penetrate the congested district on Washington Boulevard between Twelfth Boulevard and Third Street.

In November, 1922, the department of streets and sewers checked the traffic entering and leaving the congested district on 39 arteries of travel for the 11-hour period from 7:30 a.m. to 6:30 p.m., and found the following conditions:

| | Number | Per Cent of Vehicles | Per Cent of Passengers Carried |
|---|---|---|---|
| Street cars .. | 12,342 | 10 | 68 |
| Automobiles .. | 69,509 | 59 | 25 |
| Trucks and wagons .... | 36,729 | 31 | 7 |

The total movement was 118,580 vehicles, or an average of 10,780 per hour.

The large number of automobiles for the number of people they carry is not their only serious contribution to street congestion. Harland Bartholomew, city plan engineer, estimates that in the congested district the streets afford parking space for only about 2,500 cars. When this space is filled the street area available for traffic movements is reduced 36 per cent.

The effect of the increased congestion just described on street car service has been to reduce the average schedule speed about 1½ per cent since 1917 and to increase street car-automobile collisions 17 per cent in the same period. Especially during the hours of greatest demand the street cars are getting behind schedule. Checks show that in a distance of some 1¼ miles on Washington Boulevard the cars are losing about 8 minutes, and for a like distance on Olive Street the cars are losing about 16 minutes.

The first order of the traffic council was to prohibit parking on Olive Street from Twelfth to Fourth Street and around the Olive car loop, except commercial vehicles, for a period of 15 minutes. The effect of this has been to speed up the Olive Street cars 33⅓ per cent in the congested district and materially to reduce the peak-hour delays.

The speaker stated that he agrees with Mr. Bartholomew in the statement:* "The provision of parking space in city streets is not a public obligation. The parked vehicle must give way to the moving vehicle." By eliminating parking during the peak hours more than 50 per cent additional roadway would be available for moving traffic, the moving automobile traffic would be reduced about 25 per cent and the street cars would be required to handle only about 2 per cent more passengers.

The speaker also agreed with Mr. Bartholomew's conclusion that expensive street rearrangements or subway construction do not in themselves constitute a solution of street congestion. One mile of subway construction in the congested district of Boston cost some $8,000,000, and the St. Louis street car traffic does not justify such an expense.

The street improvement plan was indorsed by Mr. Lockwood. Recently St. Louis voted $87,000,000 for civic improvements, of which $12,000,000, augmented by $8,000,000 secured by assessment against surrounding property, is to be devoted to street widening and other traffic changes. To fit the tracks to these changes will cost the United Railways approximately $1,500,000. The program will take ten years to complete, but when it is through there will be a system of major streets that, with proper traffic regulations, will improve conditions greatly.

### ECONOMIC FACTORS IN CITY

Some of the more important economic features affecting street railway transportation were discussed in a paper by E. A. West, superintendent and chief engineer Denver Tramway. He stated that the time has come when railway managements must speak out and present their views frankly in discussing the many questions affecting the industry. He pointed to the dangerous congestion due to the crowding of the business districts of American cities, and stated that it is rapid transit of the masses by the electric railway that has made our cities possible. Certainly there is no other means of transportation in sight to supplant it.

The development of new suburban districts by electric railway extensions is no longer possible, as the automobile has introduced an element of uncertainty into the problem, making it necessary for the railway to wait until the territory is built up before extending into it.

The politician and promoter types of manager are gone, in Mr. West's opinion. In their place we have earnest individuals who are striving to give efficient service, recognizing that this is the only sound basis for the industry to work on. An awakened public conscience is making it harder for a certain type of politician and newspaper to use local public utilities for footballs.

While the street railway is a natural monopoly, there are many forms of competition, including the bicycle, the low-price taxicab, and the jitney. But the most disastrous form of competition the railways are up against is the private automobile. This will never be done away with, according to the speaker. Its effect can only be reduced by better service, by increased speed, by courteous, considerate treatment of the passenger, combined with the high cost of automobile operation.

The importance of good public relations was stressed by the speaker. Adherence to schedules, clean and well-painted equipment, good ventilation and heating, and good seating arrangements and lighting are advocated as means of furthering this.

In introducing new equipment, he felt that it should conform in general appearance with the old, as the general type of car has become known, and the patrons of the lines not favored with the new style cars will charge the company with discrimination. Cars can be remodeled and new cars can be added embodying the latest features of mechanical and electrical equipment and arouse no dissatisfaction, when the general outward style is retained.

It is beginning to look as if the automobile problem will take care of itself, according to the speaker. It is reported that already in some cities automobile owners are beginning to leave their cars at home and go back to the street cars. However, there is one phase of this auto situation that all of us must watch. As the situation now exists our peaks morning and evening are soaring higher and our valleys are going lower, and as you know, economically the cost of peak-load transportation is the highest because of the investment in power, rolling stock and buildings needed for peak requirements.

In considering the traffic congestion problem, in spite of all that has been said to the contrary, this matter can be introduced more smoothly, if solved by interests outside the street railway. It is a grave mistake, in Mr. West's opinion, for the management to take the lead in solving it. No doubt the street car company experts should be consulted, and without question will be called in to help out in the matter before anything final is decided. If the management is popular in a town, then it will be asked to participate in the traffic congestion study. If not popular, it won't be asked; and forcing a way in will make matters worse. We are concerned in the traffic problem, but perhaps not as much so as we think. These figures for Denver illustrate this:

AREA OF DENVER DOWNTOWN STREETS IN PER CENT

| | |
|---|---|
| Devoted to parked automobiles....... | 22.8 |
| Devoted to street car traffic......... | 1.4 |
| Available for automobile traffic...... | 75.8 |

In the discussion which followed Mr. Lockwood compared the relative value of all-day parking prohibition with rush-hour restrictions only. P. H. Conroy said that none of the business streets in the average American city had ever been intended to carry the automobile traffic of the present day.

A careful distinction between economics and economies was urged by S. B. Irelan, vice-president and general manager St. Joseph Railway, Light, Heat & Power Company. Too much attention, he said, has been given by utility men to methods of making economies, and too little to the broader question of the economic value of more convenient, frequent and comfortable service with a rate of fare sufficient to provide such service.

F. G. Buffe said that there are many indications that the automobile problem is solving itself. This was held to be particularly true in the larger cities. Americans are notorious in going to extremes in any wave of development, and the wave of automobile use is even now beginning to recede, he claimed. As a result of the expense and danger of the automobile many who have been using it as an everyday convenience will again be excellent prospects as street car customers, provided that modernization of equipment and improvement in service have in the meantime made the street car ride sufficiently attractive.

Mr. West illustrated the results which could be accomplished by selecting the proper equipment for cars by citing the increased schedule speeds made in Denver. Schedule speeds prior to 1923 in that city averaged 9.7 m.p.h. including all dead time, layovers, etc., and also including trailer operation. As a result of increasing the acceleration, and with little increase in the free running speed, the schedules were increased to 10.5 m.p.h.

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*ELECTRIC RAILWAY JOURNAL, March 8, 1924, page 366.

### Field of the Bus

"The Bus and Its Place" was the subject of a paper by Bruce Cameron, general manager for the receiver, Joplin & Pittsburg Railway, Pittsburg, Kan. He pointed out the difficulties and large expenses of constructing a new railway, as compared with the ease of establishing a bus line. The place of the bus, he said, is (1) in sparsely settled communities; (2) in new territory yet unable to support a car line; (3) on streets where there are no car lines, and yet where the car lines are near enough that new lines would not pay; (4) in large city parks where there are no car lines; (5) as miscellaneous feeders to existing car lines, where service is needed at certain hours or in certain periods of the year only. In all such cases he believes the buses should be operated or controlled by the railway in such a manner as to avoid duplication of service.

The interurban situation is quite similar, according to Mr. Cameron. There are communities that are built up around industries of short duration, that would not warrant the construction of rail lines. Also for pioneer work where there are no interurbans the bus can be used during an experimental period to determine whether railways will pay. Then, too, there certainly is a field for the bus as a feeder to interurban railways, he said.

An independent bus operator should not be permitted to operate along the same route on a city street as the car line, neither should a bus line be permitted to operate on a hard surface road paralleling an interurban line, for the simple reason that it is not sound economically—it destroys capital and is a repetition of service, to the end that neither makes any money—therefore, cannot exist.

Without question, buses are here to stay. They are operating and people are riding in them and will continue to do so. They should be taxed equally with the railroad, and pay their part of the expense, and should not be permitted to operate without certificates of convenience and necessity, and under the regulatory bodies, the same as the railroad, and then and in that case a few years will tell us what the traveling public wants—rail or rubber, and until this is settled both systems of transportation, with rare exceptions, will continue to lose money.

In the discussion, Mr. Buffe said that there was no question of the usefulness of the bus under certain conditions for feeder or auxiliary service, but that the application of this form of transportation must be approached as an individual problem for each community or district under consideration.

Mr. Irelan said that the operation of buses by electric railways may be expected to raise a question of a common fare for both buses and street cars with transfers between them. In addition, he said that when the railways begin to operate buses in conjunction with the rail lines, the question of paving costs soon comes up and there is a tendency to demand that the railway pay the cost of paving. Mr. Campbell discussed the advisability of co-operating with independent buses by allowing them to use existing railway terminals so as to make them feeders to the interurban lines.

### The A.E.R.A. Modernization Program

R. F. Carbutt, railway engineer H. L. Doherty & Company, New York, and regional vice-chairman of the committee on city operation of the American Electric Railway Association, prefaced his paper on "Bringing the Latest and Best to Railway Men" by saying that the industry is coming back only in spots, here and there, because many properties do not make use of the modern and efficient methods which are developed on individual properties. Mr. Carbutt's paper is abstracted elsewhere in this issue.

The street railway industry is today burdened with indirect taxation amounting to around 10 per cent of the gross, is the conclusion of S. B. Irelan, vice-president and general manager St. Joseph Railway & Light Company, St. Joseph, Mo., in a paper on "The Indirect Tax and the Street Car Ride." In addition to the federal, state and local taxes that are paid by all corporations and individuals, public utilities are perhaps taxed heavier under this form of tax than any other class, said the speaker, as in the past the utility business has been considered very prosperous.

There are in addition a number of special taxes on utilities and on street railways in particular, such as taxes on intangibles, franchises or easements, gross receipts and net receipts. These are in addition to the taxes levied on other business, corporations and individuals.

Other indirect taxes consist of many service burdens; paving construction, repairs and maintenance; street cleaning and sprinkling; snow removal; bridge and culvert construction and maintenance; licenses for cars, wires, track, poles and advertising; free transportation of police and firemen; and in some states a special tax for the support of the public service commission.

The speaker stressed the importance of the paving burden, stating that the industry actually is investing 3.5 to 4 per cent of its gross revenue in interest charges and replacement of paving alone.

The conclusion of Mr. Irelan was that now is the time for the industry to present its argument and facts to the public toward the elimination of these indirect and unusual taxes. In this movement, he said, the Midwest Electric Railway Association should aid by presenting the facts uniformly to the proper state officials.

In the ensuing discussion Mr. Lockwood said that the United Railways of St. Louis had paid out 12 per cent of its gross revenue last year in taxes of one kind and another, including maintenance of paving. In describing conditions in St. Louis, he said that the company is required to make the investment and pay the interest charges for paving the 17-ft. strip in the track zone, and then is required not only to maintain this paving, but its cost is added to the capital account of the company, and is again assessed in the form of general taxation.

A form of indirect taxes of unusual interest was described by Mr. Buffe. He said that the practice in Kansas City is to charge the company one-third of the cost of construction of bridges and viaducts. Mr. Welty cited a unique argument which had been used in Omaha to answer the railway company's requests for relief from paving burdens. In this case, he said, one of the reasons advanced for having the railway continue to pave its right-of-way was that its paving was so much better than that put down by contractors for the city, that it was of advantage to the city to have the company continue paving its strip.

### Future of the Interurban

A paper on the past, present and future of the interurban railway was presented by Charles W. Ford, general superintendent Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo. He traced the history of the interurban through its early stages, showing how many roads were projected and built without sufficient justification from a financial standpoint.

Since 1914, he said, there have been practically no new developments, and few extensions to existing lines. This, however, is an indication that the wild-cat promotion days are past.

Additional sources of revenue have been developed by the interurbans, such as express freight and carload freight. Increased fares and increased passenger traffic also have assisted in allowing the companies in the Middle West and Southwest to show reasonably good operating reports.

As to the future, Mr. Ford feels that the bus and the truck are not going to replace the interurban railway, as it is the cheapest and most dependable mode of travel between cities in well-developed territory. Regulation of competition will come in due course, and with the advent of lighter cars the riding can be increased and headways shortened. Freight, particularly in carload lots, should be solicited, and industries should be encouraged to locate along the lines.

Mr. Ford's paper was discussed by a number of those present. Increasing competition from private automobiles and buses was held to be forcing the electric railroads in many locations to depend more and more on freight hauling as a source of revenue.

### Revision of the Constitution

A committee consisting of R. J. Lockwood, chairman; R. B. Campbell, Bruce Cameron and Otis Turner of St. Louis reported on certain revisions of the constitution of the association. The most important of these was the provision for three regular meetings per year, and the inclusion of the grade of honorary membership. The recommendations of the committee were adopted.

Reports of the retiring president and of the secretary-treasurer showed the association to be in a healthy financial condition at the end of its first year of activities. President D. L. Fennell, superintendent of transportation Kansas City Railways, said that one of the objects in the organization of the association had been to give department heads and subordinate officials of the various companies an opportunity of getting better acquainted with the general problems of the industry and of taking part in the proceedings and discussions.

Officers and members of the executive committee for the ensuing year were elected as follows: President, Charles W. Ford, general superintendent Kansas City, Clay County & St. Joseph Railway; vice-president, E. Stenger, receiver the Denver Tramway; secretary-treasurer, J. A. Weimer.

Members of the executive committee: Two-year term, S. B. Irelan, R. A. Leussler, R. B. Campbell and D. L. Fennell; one-year term, H. B. Cobban, F. G. Buffe, R. J. Lockwood and A. E. Reynolds.

The executive committee held a meeting immediately after adjournment of the general session and elected R. J. Lockwood as chairman.

On Wednesday evening the association was entertained by the Omaha & Council Bluffs Street Railway at a dinner given in the Omaha Athletic Club. This was followed by a theater party in which the members of the association were the guests of the local railway.

# Service and the Man Who Sells It*

By F. G. Buffe

General Manager for the Receivers Kansas City Railways

THE Rotary Club motto, "He profits most who serves best," is particularly applicable to the street railway industry. Although we are in the selling business, we cannot be compared with the salesman who was happy because he made one sale every five years, his business being the selling of suspension bridges. We sell our product to every man, woman and child in the community an average of 275 times a year. We have 26 opportunities a month of making a friend of every citizen, and it is too often the case he will remember the one time when service was poor and forget the 25 times when it was good. We are in a different position from any other utility that sells service because we come in daily contact with our customers, under trying conditions. The light, gas and water companies render a monthly bill, whereas we collect at the time service is rendered.

There are other factors that make it difficult to please our patrons. We are living in a rapid age, dealing with a public educated to speed and rubber tires. This induces a psychology which affects us adversely. Our customer has been educated to believe that street car service is not rapid. The noise, the stops and starts tend to irritate him. There was a time when the street car was the fast means of urban transportation. The average man does not take into account that, all things considered, due to traffic congestion and parking difficulties, street car speed on the average is as good as the automobile, because he does not get the same sense of motion that he does in the automobile.

The street car business today is competitive, not so much with other public conveyances, but it has to meet competition of the private vehicle and overcome an adverse mental condition. The claim that our transportation service is the best—on the average the fastest, cheapest, the most convenient and the safest—is no longer accepted as a fact but requires proof and salesmanship.

The industry magazines of the last few years are full of articles on merchandising transportation selling service, training employees, proper publicity, and other methods of overcoming this mental hazard, and the time of our meetings and conventions is largely occupied with similar subjects. We have been forced to add an up-to-date sales department to an organization which in the past has been entirely concerned with operation and the manufacture of service. Some companies have gone so far as to add commercial managers. The weekly pass, which is an effort to wholesale transportation, is being tried.

Street railway service naturally falls into two divisions, one which the public sees and with which it comes in contact, and that part behind the scenes of which the public has but a hazy idea.

The public judges service by the cars; the riding qualities of the track, the headways and load conditions, and the appearance and actions of the trainmen. These are the show windows. Our patrons do not come in contact with the average two men per car behind the scenes. They do not realize the investment in shops, power plants and distribution systems, nor do they have any concrete idea of the tremendous organization and the constant effort in the background which is just as vital.

Such a situation has a tendency to reflect itself in the organization itself. It is comparatively easy to convince a platform man that part of his job is selling service, but sometimes difficult to convert the shop man to the idea that he is similarly engaged. The public to him is remote, and there is no direct contact, no immediate connection.

We of the street railways, regardless of our jobs, whether in the office, on the platform or in the pits, must work for just one end—transportation. Every other activity of necessity must be subordinated to this one objective. A track department may have ideas on track, the proper time for construction, temporary service, etc., but its ideas must in the end conform to good transportation service. In Kansas City we allow ourselves only 5 per cent of our total equipment out of service at any time for all shop and mechanical purposes. It would be easier to work out a shop schedule based upon 10 per cent, but to do so would not permit us to give our standard of service, so the shops have to do the necessary thing and adjust their program to transportation needs.

The first essential in training this sales force behind the scenes is to educate and instruct supervisory officials. It is surprising how much effort is needed along this line. Too frequently is it the case that foremen, dispatchers, inspectors and those officials who come in most direct contact with the men under them, and upon whose shoulders falls the immediate responsibility of carrying out orders and policies, do not get the inspiration that comes from contact with others in the same work in other cities by attending meetings and visiting for purposes of comparison. Very often, due to an insufficient number of supervisory officials, their work is of a nature that leaves but little time for reading or development. All this is wrong, and happily is one of the conditions that gradually is being corrected in the industry. Salaries should be commensurate with those for equal responsibility and effort in other lines. There should be every effort to bring technically trained young men into the industry.

The training of the supervisory force should not stop with department heads, but should be carried down until every man who exercises authority in any degree has been thoroughly imbued with the spirit of salesmanship and the ideal of service.

How often does one hear a stranger say: "You have the finest set of men I ever saw," or the reverse? A surly, slovenly transportation force is the quickest route to public condemnation. Transportation salesmanship requires among many others some of the following qualities: Neat appearance; a pleasant smile and manner; tact in enforcing fare and transfer regulations; helpfulness to passengers, especially old women and children; good judgment; a thorough knowledge of the city, routes, transfer points, etc.; a pride in his job and in his company; the conviction that he is a salesman selling a necessary service but at the same time a competitive one.

Employees in other departments should understand that they are the company's representatives both on and off duty; that poor work in any branch in the end means poor service. They should get the spirit of public service and realize in every operation they perform that they are quasi-public servants.

### Company Publications Help

Company publications are very effective if properly edited and prepared. Such a publication cannot be all lectures and good advice. It must be snappy, entertaining, provide good reading for the employee and his family, promote a co-operative spirit, and develop an organization morale. It must be a newsy magazine devoted to the organization and its doings, and must be written from the standpoint of the employee rather than that of the company.

Practically every company today has some form of committee system, either union or non-union, and it is a mistake to allow this elaborate machinery to function solely for the adjustment of grievances and the settlement of wage disputes. Every proper matter of policy that affects operation or the employee, directly or indirectly, should be brought before and worked out by these committees. The men should understand that they are vitally interested in all the operations of their company; that their advice is valued and their co-operation required.

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*Abstract of a paper before Midwest Electric Railway Association, Omaha, Neb., June 11-12, 1924.

### Give Praise for Meritorious Work

Don't be afraid to praise your organization. When some big thing has been accomplished, encourage and foster the spirit that your particular organization is the best in the country. If the organization has done a meritorious thing—has handled unusual crowds—has operated with a low accident record—say so. Let the men understand that you realize these things are not done solely for a money return but because they are proud of their organization and the service they are rendering.

One of the most effective methods of getting the sales and service idea over is by personal talks to the men by company officials. They bring in the personal touch and are more effective than the printed page. We are all humans, all on the same payroll, and all working for the same purpose. Give me the friendly organization every time for results.

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# Bringing the Latest and Best to Railway Men*

## The Use of Modern Methods in All Departments of the Electric Railway Is Advocated—Don't Be Afraid to Copy Good Practices Even Though They Are Not Original

By R. F. Carbutt

Railway Engineer H. L. Doherty & Company, New York

IN CONNECTION with the work of the American Electric Railway Association committee on city operation, I have been impressed with a situation which exists in our industry. This I shall attempt to analyze on the basis of the observations made in visiting various railway properties in New York State and New England. The situation to which I refer is that generally, as an industry, we do not make use of modern methods of electric railway operation that are in effect here and there throughout the industry.

Information regarding modern methods is collected and disseminated by ELECTRIC RAILWAY JOURNAL, *Electric Traction, Aera,* by committee reports and papers. We discuss them in our conventions and meetings such as you are holding here in Omaha today, but we don't put them into general effect. The modern methods to which I refer are not the ones that require a large expenditure of capital. Up to date, from New England and New York State alone, I have received seventy comprehensive one-page descriptions of modern methods, only a very small number of which require the purchase of new equipment. They are modern methods of securing public good will, of developing good relations between management and employees, of training personnel, of popularizing electric railway service, of securing economies in operating and maintenance practice and of securing relief from paving burdens and other imposts.

### Use Methods Tried by Others

You say "Why copy the ideas of others, why not be original?" Originality is, of course, highly meritorious. We should be looking for the new ways of doing things. But lots of us can benefit merely by applying to our own property modern methods proved feasible and profitable by others in our industry.

We should not be backward, either, in putting it up to the manufacturer of the materials and equipment we use to give us better and more efficient and less costly materials and equipment for use in electric railway transportation. But we have not begun to scratch the possibilities before us until modern methods in use here and there are widely used in the industry.

### Apply Modern Methods to Present Systems

I do not mean to infer by anything I have said that adopting modern methods means discarding our present general scheme of providing transportation by the electric street railway and electric interurban railway. I am not opposed to the use of the gasoline passenger bus or the interurban bus by the electric railways, and do not hesitate to recommend its use where it is economically justified, but I believe in co-ordinating the gasoline bus with electric railway operation, and not in the substitution of the bus for the latter.

I could give you many specific references to prove that what we need is the adoption of modern methods in the operation of our present systems, but for the sake of brevity and to emphasize the fact that the condition just referred to does exist, permit me to quote from the 1923 report of the Charles A. Coffin Prize Committee, composed of C. D. Emmons and James H. McGraw:

"From the representations of the winning company, the committee finds that on this property there have been carried to fruition most of the things that have been talked about for years as the remedies for various troubles. On this property the remedies have not only been talked about; they have been executed. Thus the winner stands out as a railway that has largely accomplished the task of gaining public good will, of merchandising transportation, modernizing service and equipment, improving the financial structure, and so on. There is no one great achievement on which the committee has based its award, but rather upon the accumulated results of a great many small accomplishments."

Mr. Budd did not claim originality of methods for the Chicago, North Shore & Milwaukee, but merely the use of modern methods we have talked about. In expressing his appreciation and thanks for the award of the Coffin Prize on behalf of the Chicago, North Shore & Milwaukee Railroad, Mr. Budd said in part:

"We have done little that is unusual, and little that is original. Practically all our methods and engineering practices that are discussed in this great American Electric Railway Association and in its committee meetings. We have simply taken advantage of every opportunity that presented itself to modernize and make popular electric railway transportation."

### Efficient, Humanized, Personal Service

Doubtless this same policy of adopting modern methods in use here and there accounts for the recent success of another company directed by Mr. Budd, the Public Service Company of Northern Illinois, in securing the Coffin Prize for distinguished accomplishment in the light and power field. Many inspiring things were said at the 1924 National Electric Light Association convention in Atlantic City and many methods advocated that showed great care in their preparation, but a few words uttered by Mr. Budd at the N. E. L. A. convention this year gave me a thrill and stand out clearly in my memory above the expressions of other speakers. In accepting the Coffin Prize from President Johnson Mr. Budd regretted time did not permit him to tell a little about the winning company, but he said the company he represented "was endeavoring to give an efficient, humanized, personal service." That statement is a very broad one and summarizes in a few words what might have been profitably elaborated into a very lengthy description of methods, policies, activities and efforts. I have tried to visualize, many times, since hearing that expression, what it would mean to the banking credit of the electric railway industry if we were all giving an efficient, humanized, personal service. The unregulated competing bus and even the private automobiles would not present the problem they do today, if we all gave that kind of a service.

My sympathies are entirely with the electric railway operator, and I appreciate fully that no class of men give of their strength and personal sacrifice for the service of the public to the extent that he does. I want to suggest a reason or two for the lack of a more general application of the many improved methods developed by individual properties.

Now just why does this condition exist? One reason is because most railway organizations have been cut down to a skeleton form during the economic pressure of the World War and post-war period. The result is that the average street railway and interurban company does not have free lances on its staff who have the time and the funds at their disposal to investigate the modern methods being used and apply them to their property. In many cases there is no one available even to review the trade journals and work up the application of modern methods were described.

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*Abstract of a paper before Midwest Electric Railway Association, Omaha, Neb., June 11-12, 1924.

### SPECIAL COMMITTEES CAN HELP

And now what is the remedy that may at least be of some help and can be of great help if properly used? Through the suggestion of the man who has been winning these prizes a committee was appointed last November to make a survey of the entire street railway and interurban industry, throughout the entire United States, with the object of collecting a description of modern methods in use and disseminating this information throughout the industry.

In the case of some companies, of course, this will not suffice. It will be necessary and advisable for some of us to call in specialists to study our situation thoroughly, diagnose our ailments, and prescribe remedies after careful and due consideration of all the facts in the case. But many of us will be able vastly to improve our situation if we will use the information Mr. Budd's committee is collecting and apply the methods to our own property.

The handbook the committee is preparing will consist of one-page summarized, comprehensive descriptions of each modern method called to our attention so they will not be burdensome for you to read. You will be able to use this handbook to check against your own operation and see just how modern you are.

The result of all this will mean that the small company which does not have free lances on its staff with the time and funds at its disposal to investigate the modern methods used by others will have part, at least, of this service made available to them at a very moderate cost.

### SOME HAVE LOST FAITH

Another reason the condition referred to exists in the industry, that is, modern methods not universally used, is, I believe, that some of us have lost faith in the soundness of our electric methods of handling transportation and we don't bestir ourselves to keep modern. Psychology has had a lot to do with the situation. Some of us have listened and believed some of these false prophets that have told us we were all wrong and sick and about to die.

These false prophets overlook the fact that the conditions are not the same in the application of the two general systems where the gasoline bus is recommended to supersede the electric street cars. If gasoline buses are to be operated by a number of irresponsible people, of no financial standing or credit, not required to give continuous service, over definite routes, at stated intervals and during all seasons; not required to protect passengers from damage and accidents; unregulated as to accounting system; permitted to charge a higher rate of fare; relieved of paving, snow removal, sprinkling and cleaning streets, burdensome taxes and other imposts; of course they can compete with the electric street car.

Instead of believing these false prophets let us believe men like Peter Witt and Henry L. Doherty.

In an interview in the June *Aera* Peter Witt is quoted as follows:

"I am not worried about the future of the street railways. Economic law rules the roost—the most efficient and most economical facility for any particular purpose survives. Vehicles mounted on steel wheels running on steel rails are moved at least expense and with greatest speed. That's why the street cars will continue to carry the crowds, and why the bus and private automobile are not going to put them out of business. Street railway operators must make their service more attractive, their cars more commodious and comfortable, and city governments must co-operate with them."

In the annual financial review, supplement of the New York *Tribune* for Jan. 7, 1924, Henry L. Doherty, commenting on the railway's return to prosperity, was quoted as follows:

"The street railway business received a severe jolt by the high level of prices for labor and material caused by the war, but these companies are gradually getting back on their feet. The business is still intrinsically sound, and can supply service to the public at a price the public can afford to pay, and well below the price which would have to be charged by any other form of transportation where the same service is rendered."

To summarize the one thought I have attempted to convey, let us universally, as an industry, have faith in our electric street railway and electric interurban scheme of handling transportation; apply modern methods to their operation; co-ordinate this service with bus operation where economically justified; and in every community, attempt to give efficient, humanized, personal service.

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# Welding Shops and Electric Rolling Stock Discussed by A. R. A.

### At the Atlantic City Convention of the American Railway Association Mechanical Division, Just Closed, Reports Which Have Points of Particular Interest to Electric Railways Were Made by Several Committees—Electric Locomotives Discussed

SESSIONS and exhibits for the mechanical division of the American Railway Association were held at Atlantic City, June 11 to 18. Some of the committee reports presented have sections of interest to electric railways and these are abstracted herewith.

### AUTOGENOUS AND ELECTRIC WELDING

The report of the committee on autogenous and electric welding contained several plates showing the effects of welding on the metal in the tread and flanges of wheels and the structural transformation of axles. In the case of electric welding of steel and steel-tired wheels the difference in physical properties found at different depths from the point of application of the metal is evidently due to the order in which the various layers of filler metal were applied. The hardest zone is produced under application of the filler metal while the base material was relatively cold, acting thereby as a more severe quenching medium against the zone heated by the arc of welding than in cases where the tire had been to some extent preheated by previous heat of welding. In this case the maximum increase in hardness and strength of the base material, due to the transformation of the structure by welding, was approximately 40 per cent and the hardness of the applied low carbon metal was approximately 55 per cent of the original hardness of the tire material.

The structural transformation of tires by gas welding showed a reverse condition, inasmuch as the heat imparted to the base material has a slower penetration than the electric arc, and instead of increasing the hardness and strength in the transformed zones, the physical properties were lowered as a result of annealing by the slow application of the heat. The maximum decrease in physical properties of the base material by gas welding amounted to approximately 24 per cent. The hardness of the filler metal itself is approximately the same for the gas and the electric weld, but the gas weld shows distinct decarburized zones forming the junction between the applied filler metal of the base material. Similar conditions were found for rolled steel wheels.

Welding of steel and steel-tired wheels will invariably cause a distinct local change in structure with resultant internal stresses unless the material is properly preheated and annealed after welding. It has to be considered further that the applied filler metal, either carbon or alloy steel, has, in most cases, different hardness and physical characteristics than the base material; moreover, with the gas welding process a pronounced decarburized area is formed between the base material and the filler metal. For this type of welding it is very probable that the filled-in areas will slough out readily by parting along the decarburized zone. Against this the electric weld has the pronounced disadvantage that unless a rather deep penetration of the heat is obtained, with consequent increase of internal stresses, the filler metal will not adhere properly. The committee holds that there is no doubt that if welding of this kind would be permitted rulings as to proper preheating and annealing would in a large number of cases be disregarded, and wheels and tires in a state of high internal stresses would be placed in service, with the result that failures directly due to the welding would occur.

### WELDING OF AXLES

A similar condition of structural transformation due to welding exists on axles where the carbon ranges above 0.30 per cent. The transformation in structure with corresponding internal stresses at points in an axle where bending stresses of any magnitude occur will readily permit development of detail fractures, and welds can, therefore, not be permitted on any part of the axle, with the exception of the building up of end collars, where practically no bending stresses exist. Such welding may be done by the electric welding method without preheating or annealing. The gas method is not recommended unless it is controlled so as to avoid the possibility of excessive heating during welding, which may, if not properly controlled, cause transformation of the structure at the point where bending stresses occur.

The report of the committee illustrated the service failure of a railroad motor car axle on which the inner fillet of the journal bearing had been rebuilt by the electric process. The fractured face showed a distinct progressive failure starting from the zone of applied filler metal. The longitudinal etching showed the pronounced structure transformed which caused internal stresses, evidently the direct cause of development of rupture. The pronounced structural transformation indicated that the axle was not preheated or annealed after welding.

On low carbon steel the transformation of structure due to welding heat is not very severe, and while it is desirable to remove all local transformation of structure by annealing, in a number of cases the service stresses of the welded member are such that welding may be done without subsequent annealing. The general rule, however, applies that on account of the more gradual heat applied by the gas welding method the transformation in structure is less abrupt and the internal stresses imparted to the material are, therefore, not as severe as those obtained by the electric welding method. Moreover, the fusion obtained by the gas welding method is better and the filler metal shows less slag and oxide inclusion than that applied by the electric welding process.

While it is possible to weld, with relative small reinforcement, wrought iron by either the gas or electric method, so that the yield and ultimate strength closely approximates the strength of the bar itself, the filler metal shows practically no ductility. Fatigue tests on specimens of uniform cross-section, welded and non-welded, wrought iron bars, tested under identical conditions of deflection, showed the resistance of the welded section against vibratory stress to be approximately 50 per cent of the non-welded bars, gas welds being slightly superior to electric welds. Good quality area caused the vibratory fractures in practically all cases to occur through the base material adjacent to the reinforced section, at about the same number of deflections as were obtained for the non-reinforced welds. This is evidently due to localization of bending stresses caused by increased stiffness of the reinforced section. Therefore on wrought iron where the resistance to vibratory stresses is of prime importance, such as in arch bars, welding of cracks cannot be permitted, according to the report. Worn places may be built by either the gas or the electric welding method, provided the original cross-section of the bar has not been reduced below a specified minimum. Where the built-up parts are subjected to vibratory stresses it is preferable to anneal subsequent to welding.

All cast-iron parts, except cast-iron wheels, may be welded. The gas welding method should be used wherever possible. Welds of 100 per cent strength, without reinforcement, can be obtained readily by proper preheating, using cast-iron welding sticks.

Welding of flat spots on cast-iron wheels produces a similar condition as is found on welded wrought-steel wheels and tires. The welding heat causes a distinct change in structure of the material adjacent to the weld. Moreover, on account of the relatively high internal stresses which exist in all chilled cast-iron wheels, such welding could only be done by careful preheating of the wheel followed by uniform cooling, inasmuch as heat locally applied would readily cause cracks through the chilled area like those produced by excessive brake-shoe action, or even entire rupture of the wheel. The filler material itself would be much softer than the chilled portion of the wheel, and a filled-in area would offer little resistance to wear. It is doubtful that cast-iron wheels would be properly preheated and cooled when welded, hence wheels in a state of highly unbalanced stresses might be placed in service. The committee therefore recommends that any welding on cast-iron wheels be prohibted.

In general, it may be stated that welding or heat cutting will impart internal stresses to the base material which are in approximate direct ratio to the carbon content and in inverse ratio to the original temperature of the base material. These stresses are produced by the local transformation of structure, which is caused by heating the surface metal to a temperature above the recalescence point and the underlying cold base metal acting as a quenching medium. With normal conditions any detrimental effect on the base material can be removed by subsequent annealing or sufficiently high preheating. Welding or heat cutting of medium or medium-high carbon steel should, therefore, be done only under careful supervision, and in no case should any such welded or cut material go into service without full assurance that after these operations were performed the entire part was annealed at a temperature above the recalescence point of the steel or that the affected zone, which increases in depth with the increase in thickness of material, was removed by machining.

The committee recommended that the welding of cracks or fractures be not permitted on such parts as air reservoirs, brake levers, drawbars, steps or step straps, and wheels.

Specifications for welding wire submitted as recommended practice were drawn up to cover the usual grades for electric and gas autogenous welding. These were prepared in co-operation with the American Welding Society. No attempt was made to cover welding wires for certain special purposes, as it was felt that these special grades of wire might not be applicable to the general purposes and would cause confusion among users, if included in a general specification.

### WHEELS AND WHEEL MOUNTING

The report of the committee on wheels contained information in regard to the application of new specifications adopted last year for cast-iron and rolled steel wheels. Considerable information was also given in regard to developments in cast-iron wheel design and cast-steel wheels. Since at present the manufacture of cast-steel wheels involves a patented process, the committee did not feel that a standard specification should be issued now.

The type of wheel mounting gage used by the railway association has been subject to considerable criticism during the past year. This mounting gage was primarily designed for use on cast-iron wheels, and when used on steel wheels special conditions are found to exist which make it unsatisfactory.

Where two sharp-flanged wheels are mounted together use of the standard gage results in improper mounting. That is, when the wheels are turned they will be found to be spaced too wide. This practice of mounting two sharp-flanged steel wheels is common practice on many roads, as they dismount sharp-flange wheels to re-mate, in order to save metal on mated wheels.

The opinion of the committee as to the proper way to mount rolled steel wheels is to use a spreader gage, such as is used in mounting locomotive tires. This gage should be 53⅜ in. long. The committee does not recommend that this be made a standard gage of the association, but suggests that the individual railroads equip themselves with gages of this type for checking the mounting of rolled steel wheels.

The standard steel wheel gage adopted in 1923 is gradually coming into general use. Generally speaking, this is giving satisfactory service.

### ELECTRIC ROLLING STOCK

The report of the committee on electric rolling stock contained a summary of answers to questions covering the period for inspection and repairs which showed eight roads favoring mileage, one favoring hours or days in service and one favoring power input. Two others recognized power input as a factor but considered mileage more practical. The wide variation of mileage specified between periods of inspection and repairs indicates the difficulty in establishing definite figures. Five roads reported in favor of daily inspection and five against it. At present all roads practice the customary daily inspection and a more or less perfunctory electrical inspection to determine whether or not the equipment responds to various control operations.

The report of the committee on design

of shops and engine terminals included answers to questions regarding the serving of machine tools by traveling cranes, which indicated that the consensus of opinion is that a traveling crane should serve all the largest machine tools. A study of replies to a question in regard to location of locker and washroom indicated that the majority of shops which do their work on the first floor also have their lockers and washrooms on the first floor or in an outside building. Practically all the shops that do their work on the balcony have lockers and washrooms on both floors.

### Electric Locomotive Discussed

Following the paper on electric locomotives by F. H. Shepard, Westinghouse Electric & Manufacturing Company, which was abstracted in last week's issue of the JOURNAL, J. A. Carmody, New York Central, presented some facts in regard to the performance of their locomotives. He said that now, after 17 years of passenger service, the original 35 Type S locomotives are about to be shopped for general overhauling. During these 17 years the 35 locomotives have made an average of 450,000 miles each or approximately 2,200 miles per locomotive per month. The average cost for maintenance, including inspection, repairs, renewals and painting, has been about 6 cents per locomotive-mile. It is estimated that the cost of general overhauling will be about $12,000 per locomotive. The additional 12 locomotives purchased in 1908 have been giving equally gratifying results.

A comparison of advantages of electric versus steam locomotives was given by W. L. Bean, New York, New Haven & Hartford Railroad. He said that the first group of 40 electric locomotives purchased by his company are about 17 years old and have run approximately a million and a half miles. They are still used in heavy express service.

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## Southern Equipment Men to Meet at Erie

THE regular July meeting of the Electric Railway Association of Equipment Men, Southern Properties, will be held at Erie, Pa., on July 23 and 24. The first day of the session will be spent in discussing various problems that are common to these railways, and exchanging ideas. The second day of the meeting will be spent in inspecting the local shops and carhouses.

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## Wyoming Association to Meet

A TWO-DAY convention of the Wyoming Utility Association will be held at the Elks Club, Casper, Wyo., June 23 and 24. Among the papers the following should be of interest to electric railway men:

"The Motor Bus as a Public Utility," by William B. Cobb, Casper; "Uneducating the Public," by George E. Lewis, Denver, Col.; "Winning Public Confidence," by C. L. Titus, Cheyenne.

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# Recruiting Transportation Employees*

## One of the After Effects of the War Has Been a Noticeably Reduced Efficiency of Transportation Employees—Present Methods of Their Engagement and Discipline Are Described

By D. Prins
Transportation Engineer Brussels Tramways, Brussels, Belgium

THE thirty-one companies which replied to the data sheet sent out by the association report lower efficiency and less regard to discipline among transportation employees than before the war. This is shown in the larger number of accidents, higher consumption of energy in car cperation, waste in material and carlessness in fare collection. The subject will be considered under four heads, namely (1) motormen, including chief motormen, (2) fare inspectors, (3) conductors, (4) a special report on the supervision given to motormen by the Brussels Tramways Company, especially in connection with the subject of energy consumption.

### Motormen, Including Chief Motormen

Practically all of the companies replying report the employment of chief motormen, as well as motormen. The number of chief motormen on the different systems varies greatly, but the following are typical: Amsterdam has 25 chief motormen to 304 cars and 10 buses, or an average of one to every 12½ vehicles. Antwerp has an average of one chief motorman to every 43.2 cars, Brussels one to every 33 cars and Copenhagen one to every 36.5 cars. The duties of a chief motorman are not only to instruct new motormen and check up the performance of the older men, but also to help out the inspectors in case of accident where their technical knowledge of car operation will be of help, to watch out for operating economies in the car service, etc.

Generally, these chief motormen are promoted motormen, though two companies report they are recruited exclusively from among the inspectors and three others use their inspectors to perform the duties of chief motormen. A number of companies require a minimum service of 10 years before appointment as chief motorman, and the age limit is usually between 35 and 40 years. After instruction, a candidate for such a position has to pass an examination before being appointed. On most roads the chief motormen are instructed to pay special attention to means for securing economy in energy consumption. In Brussels, economy is secured entirely through this force, as meters are not used, but this point will be taken up in greater detail later.

If these men are chosen carefully, their services are fully warranted. Their examination should be partly oral and partly written. They should be asked, for example, what steps in the way of rerouting to take in case of a breakdown at an important crossing or elsewhere on the line, etc. They ought to be subject to re-examination periodically, and it is advisable at least once a month to have such a man return to the front platform as a motorman for one or more trips to keep familiar with a motorman's duties. Periodical physical re-examinations are also desirable. On systems operating from 200 to 400 motor cars a chief motorman for every 30 cars is a reasonable allowance.

The regular motormen, on the properties replying to the data sheet, are recruited from various fields, varying with the location of company. Thus, the Bordeaux company reports its force recruited 50 per cent from agriculturists, 20 per cent from city laobrers, drivers, etc., and 30 per cent from the semi-skilled trades. The company in Nice gives the percentages mentioned as 27 per cent, 31 per cent and 42 per cent, whereas Bucharest reports that 97 per cent of its force of motormen came from the farms. In Paris the company declines to employ skilled or semi-skilled men, because it finds that these men accept a job on the platform only as a stop-gap and will return to their better paid trade as soon as opportunity offers.

A number of companies (10 out of 31) select their motormen from among the conductors. Thus, in Copenhagen every platform man is first taught the work of a conductor. Then after two years he learns how to be a motorman. Then he serves alternately at the two jobs until his seniority is such that he may be permanently assigned to one service or the other. Thus, this company has 594 men working only as motormen and 468 who work sometimes on one end and sometimes on the other end of the car.

Generally the companies report the minimum age for employment as 21 to 25 and the average maximum age at 35.

The period of instruction for motormen, according to the reports received, is about six weeks. In Paris, from 17 to 21 days of this time is spent in the school and six days on the road. Several companies like Bordeaux and Naples have a special school car, which operates over the system. In Brussels use is made of a text book, giving all the information which the company believes the motormen require.

A number of companies do not pay student motormen for the period spent in instruction. Others pay a certain sum, but only at the end of the period and if the man is employed. On certain properties a government examination is required before a man qualifies. About half of the systems reporting have re-examination of the men at periods of from two to six months, a year, three or five years.

Where economy meters are used, it is customary to give some sort of a bonus to the men for savings effected. The Bordeaux system has worked out an ingenious formula for the purpose.

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*Abstract of a report presented at the biennial meeting of the Union Internationale de Tramways, de Chemins de fer d'Intérêt local et de Transports Publics Automobiles, Paris, June 16-21, 1924.

This formula is

$$P = \left(B - K\frac{B - b}{n - 1}\right) N$$

in which $P$ is the amount of monthly bonus to be paid, $B$ is a selected maximum for the daily bonus, $b$ is a selected minimum for the daily bonus, $n$ is the number of motormen winning bonuses, $N$ is the number of days' work during the month by the man, and $K$ is a factor whose value is 0, 1, 2, up to $(n - 1)$, according to the rank in the saving of energy. In practice on this road, $B = 0.7$ franc or 3.5 cents and $b = 0.15$ franc or 0.75 cents. Then the best motorman, if he worked 28 days, would receive in cents at the end of the month $P = 3.5 - 0\left(\frac{3.5 - 0.75}{n - 1}\right) 28 = 98$ cents, and the lowest motorman would receive $P = \left(3.5 - (n - 1)\frac{3.5 - 0.75}{n - 1}\right) 28 = 21$ cents.

Havre gives its bonuses at the end of the year, but only to employees who have no demerits for other faults. Marseilles gives an award of 16 francs (80 cents) per month to every motorman who has had no collision or accident for which he was responsible.

The European system of zone fares requires a corps of fare inspectors who board the cars at intervals and inspect the tickets to see that passengers are not over-riding the distance for which they have paid. Since the war the conditions under which fare inspectors operate have become more arduous, partly because the electric railway systems have not expanded with the traffic so that the cars are crowded, and partly because of the laxity already mentioned in the standards of the conductors in collecting fares.

On most roads there are one or more chief inspectors to supervise the services of the inspection force. The total number of inspectors, as compared with the number of cars in service, is given for 14 principal cities in the accompanying table. To some extent, as regards street inspection, the duties of the chief inspectors correspond to those of the chief motormen as described, so that companies having a considerable force of chief motormen have a small force of chief inspectors and vice versa. As a rule, these men are recruited from existing personnel, either motormen or conductors.

Bonuses can be given for meritorious service, but it is somewhat dangerous to base them on the car-mile run during the day, as in Naples. The reason for this is that the inspectors have authority to short-route cars and should do so when the traffic requires it, but if their bonus is based on the car-miles run, they might instruct the motormen to increase the speed of their cars in the suburbs in order to avoid turnbacks. This would increase the car-miles run, but it would be at the expense of the service.

As with motormen, statistics as to the previous calling of conductors are on the various properties. In Paris skilled workmen are not desired for the same reason as with motormen. Christiania gives preference to those men who have passed an examination for non-commissioned officer.

The period of training also varies greatly. The maximum is probably Alexandria, where with the natives employed from 30 to 40 days is common, down to Naples and Lausanne, where the minimum is three days. In Paris five days are given in the school and from four to eight days on the road. In Brussels the time is nine days, divided as follows: One day theoretical instruction in the school, three days practical instruction on the line, the fifth day at the school with a couple of hours in the motorman's school to teach the manipulation of the brakes, the lighting circuit and the conduit plow, three days on the line, and the last day examination. Of the 31 companies reporting, only four felt the need of a school for conductors. Paris, which has three schools, uses a movie film showing all of the operations required in the daily work of a conductor.

In general, student conductors are paid while learning, though among the 24 companies reporting payment, seven withhold the amount until after the man is accepted. In Paris, as with motormen, the student conductor receives 14 francs (70 cents) if he does not quit learning voluntarily, and after he has been in the service six months gets 2.50 francs (12½ cents) more per day for each day served as apprentice. Only six companies pay anything additional to teacher conductors for instructing and on those properties the payment is only from 15 centimes to a franc (¾ cent to 5 cents) per day.

Eight companies still report the employment of some women conductors. Generally the pay is about 10 per cent less than that paid to men conductors.

Only a very few companies pay any bonus to conductors. Those which do are: (1) Naples, where the bonus is based on the gross receipts and car-miles; (2) Christiania, which has a merit system for bonuses; (3) Havre, which gives conductors the same bonus as the motormen but reduced in case of demerit; (4) Orleans, where the bonus is based on the receipts, and (5) Paris, which has a profit-sharing system for all employees.

INSPECTORS, CARS AND BUSES ON VARIOUS FOREIGN PROPERTIES

| | Number of Ticket Inspectors | Number of Motor Cars | Number of Trail Cars | Total Cars and Buses per Inspector |
|---|---|---|---|---|
| Alexandria | 65 | 72 | 57 | 2.0 |
| Amsterdam* | 21 | 304 | 224 | 25.6 |
| Antwerp | 37 | 216 | 137 | 9.5 |
| Barcelona* | 64 | 371 | 117 | 7.7 |
| Brussels | 78 | 463 | 371 | 10.6 |
| Buenos Aires | 230 | 1,570 | 750 | 10.0 |
| Copenhagen* | 54 | 426 | 440 | 16.2 |
| Glasgow | 82 | 974 | ... | 11.8 |
| Havre | 42 | 102 | 41 | 3.4 |
| Leeds* | 42 | 370 | ... | 8.9 |
| Marseilles | 161 | 425 | 451 | 5.4 |
| Paris* | 1,963 | 1,821 | 868 | 1.9 |
| Rotterdam | 24 | 201 | 156 | 14.8 |
| Strasbourg | 26 | 125 | 190 | 12.1 |

* These properties also operate buses as follows: Amsterdam, 10; Barcelona, 5; Copenhagen, 13; Leeds, 7; Paris, 1,115.

To become a motorman on the Brussels Tramways system, a candidate must be a Belgian, at least 22 years old and not more than 35 years old, except that a man having an honorable discharge from the army is accepted up to 40 years. The candidate also must have passed a satisfactory eye test. Then if his references are satisfactory he is allowed to take the examination for motorman.

His period of instruction lasts 15 days, during which he receives a daily wage of 5 francs (25 cents). During the first three days he reports at the school at 7:30 a.m. to receive theoretical instruction and in the afternoon operates a car under the direction of an instructor. The instructors are qualified motormen with at least ten years of experience and are paid 25 centimes (1¼ cents) per trip taken with a student. After the student motorman has run his car over a lightly traveled route he makes trips over other lines on the system, in each case being accompanied by an instructor connected with the depot from which the line runs. About the middle of his instruction period the man returns to the motorman's school, where the chief instructor examines him to see whether he remembers the instructions given. The three last days of the apprenticeship are devoted to an examination in the school and on the line, to determine whether he can qualify. It is estimated that the instruction of a motorman, including the payments to the instructors, costs the company about 93 francs ($4.65). A motorman is not fully accepted until he completes six months of service.

The motorman's school contains a full-sized car front platform with controller, hand brake, air brake, sanders, etc., also short full-sized sections of overhead trolley and underground conduit construction. Recently a few psychological tests have been added to determine whether the prospective motorman can think quickly enough to be depended upon in cases of sudden emergency to avoid accidents.

Instruction in car operation does not end after a man has been accepted. He is questioned from time to time on the principal rules, and if he seems unfamiliar with his work, he is required to take another course at the school. To help him, the company gives to each motorman a book entitled "What a Good Motorman Ought to Know."

Special instruction is given in regard to means of securing economy in energy consumption. Up to the present the company has not equipped its cars with meters, because it believes its local conditions would prevent their satisfactory use. Some of the lines are level, but many of the others are on steep grades, so that it would be impossible to establish any bogie per car-mile for energy consumption. Moreover, it is not the practice to operate either the same cars or the same motormen each day over the same lines, and experience has shown that even on the same lines the energy consumption per car-mile varies greatly according to traffic and other conditions.

In consequence, the company has put up the responsibility of economy in energy consumption to a special corps of men consisting of 16 "chief motormen," or inspectors, who travel over the system daily, watching the performance of the men and coaching them on what to do. There are about 470 motor cars on the system. The result, in the opinion of the management, has been satisfactory, as shown by the following figures on watts per car kilometer: 1916, 872.8; 1917, 867.4; 1918, 869.8; 1919, 861.3; 1920, 869.6; 1921, 846.7; 1922, 841.0.

The chief motorman receives a bonus monthly, depending on the saving made, as determined by the substation meters.

# American Association News

## Executive Committee

WHILE waiting for the arrival of President Budd, J. N. Shannahan, first vice-president, presided at the meeting of the executive committee held in New York on June 20, and disposed of the routine business. Other members present were Secretary J. W. Welsh, C. L. Henry, M. B. Lambert for H. D. Shute, J. G. Barry, J. H. Hanna, A. A. Hale, C. E. Morgan, J. K. Punderford, E. M. White, H. A. Johnson, W. H. Hyland, F. R. Coates, C. R. Ellicott, L. H. Palmer for C. D. Emmons, and L. S. Storrs.

Reports were heard from the secretary and from various standing committees, including finance, meetings and subjects, publicity, company membership, and individual membership. Mr. Coates, as chairman of the meetings and subjects committee, recommended that Wednesday be set aside as the day of the convention at Atlantic City in October on which no business meetings be held, the idea being to devote the entire day to the inspection of exhibits. His recommendation also provided that the meetings of the American Association should be held on Tuesday, Thursday and Friday mornings. The executive committee approved.

At this point President Budd arrived and took charge of the meeting. Mr. Henry reported for the committee on national relations. Speaking of the railroad labor bill, he said that the probability was that electric lines would be excluded when the bill comes up at the next Congress.

A motion was made on the floor of the Senate to reduce the car fare to 5 cents in Washington, D. C., but was lost on a point of order. An appeal was taken from the decision of the chair but the chair was sustained by a two-thirds vote. On Section 15a of the interstate commerce act, Mr. Henry said that the Interstate Commerce Commission had sent out a questionnaire and meant to make a decision for each individual road on the basis of the reply. In connection with the hearings on depreciation, Mr. Henry said that the commission will probably make a tentative order and then call for hearings on it. He was anxious that the electric railways should be prepared to present their case in the most effective manner and asked that the association authorize this work.

The exhibit committee reported to date that 71 manufacturers have made application for 41,694 sq.ft. of space, which compares with 18,000 sq.ft. on the same date last year. Of this space, 35 per cent has been applied for by bus manufacturers. There will be about 85,000 sq.ft. of space available this year. The executive committee approved the following resolution submitted by the exhibit committee:

*Whereas*, certain manufacturers of automotive equipment brought buses to Atlantic City during the 1923 convention and parked such vehicles at advantageous points in the vicinity of prominent hotels and extended invitations to various railway delegates to accompany their representatives on demonstration trips, and

*Whereas*, such practices tend to defeat the purposes of the exhibition by reason of such railway delegates absenting themselves at various times from the exhibition proper and thus perhaps neglecting the study of exhibits of other manufacturers; therefore, be it

*Resolved*, that this executive committee in meeting assembled this 20th day of June, 1924, hereby vote to look with displeasure upon any manufacturers having exhibits at any place other than that designated by the association.

Some discussion followed about the possibilities of emphasizing good management and modernization at the October convention. It was also suggested by Mr. Welsh that opportunity ought to be given railways to exhibit new devices or methods they had developed. Mr. Budd commented that if there were better facilities at Atlantic City he would send a new five-car train down there, and he thought other railway companies would be glad to show some of their new equipment. It was first thought that it would hardly be worth while to do this, in view of the fact that the only place such cars could be exhibited would be on one of the near-by streets. However, on further thought it was decided that with proper publicity at the convention directing attention to these cars, it would be worth while and plans will be set in motion to get car manufacturers and railway companies to provide a real exhibit of new electric railway equipment at Atlantic City.

As Mr. Collier expressed it, if there is anything which typifies electric railways it is mass transportation, and we need to have more in the exhibits which reflects the main work of the industry. The bus is new and attracts a good deal of interest, but it is not the vehicle of mass transportation, except as an auxiliary.

The exhibit of railway company devices and methods will probably be provided for by allotting space to the committees on city and interurban operation, whose function at the convention will be to bring forward the new methods and equipment they have found in visitations during the year.

President Budd suggested that in line with the work of pushing the idea of modernization, a committee of three should be sent to England, and perhaps France, to study the principal features of railway and bus operation there, and to see what there was of particular interest at the British Empire Exposition at Wembly. He suggested that if the association would send one man, he would send another and would ask Mr. McGraw to send one of the editors of ELECTRIC RAILWAY JOURNAL, as the third. Mr. Collier moved the appointment of this committee and approval of the plan. The executive committee passed the motion. Later on Mr. Budd took the matter up with Mr. McGraw and he promptly agreed.

Mr. Storrs reported for the committee on co-operation with the National Automobile Chamber of Commerce. He said that an effort was being made to determine whether the Chamber and the Railway Association could agree upon a common plan for relief of traffic congestion. Plans have been set in motion to bring together and collate all suggestions for relief made to date. These will be briefed and sent to the committee for consideration at its next meeting. It is planned that the committee may possibly father the idea of having a scientific survey made by an organization of experts, and perhaps of working out a complete plan for some one city to serve as a model. If this seems desirable, the matter will again come before the executive committee for approval.

Mr. Storrs brought before the committee a recommendation that the by-laws be so amended as to include within the membership of the association the bus subsidiaries of railway companies and to include the revenue from bus operation by railway companies as the basis upon which dues are to be figured. The sense of the meeting was to approve the plan in principle, but it was referred back to Mr. Storrs' committee to bring in a definite recommendation for rewording of the by-laws.

Mr. Budd then told the committee of the plan which has been worked out with universities in Illinois to establish public utility courses. This will be covered in a later issue of the JOURNAL. He also gave a last-minute report of the status of the campaign to sell $5,000,000 of prior preferred stock of the Chicago elevated lines on the "passenger partnership" plan, as the company calls it.

G. C. Hecker, of association headquarters, read a very interesting paper on revenue and expense from bus operation as shown by a number of electric railway companies, but the figures are not available for publication. Following this Mr. Budd commented that if the executive committee could do so, it ought to impress on railway men everywhere at every opportunity the importance of taking up the bus in its own and contiguous territory. He expressed again his regret that railway men were not prepared to take up the buses earlier. He thought the work of The Milwaukee Electric Railway & Light Company was an outstanding example of what can be done when a railway really takes hold of this new form of transportation. This company is acting as the medium through which the public is served with power, gas and all transportation service in its entire territory. This policy toward the bus has been satisfactory from the standpoint of public relations and has been an insurance that the railway would continue to dominate the service in its territory. Mr. Budd thought this program was worth whatever it had cost, though he believed most of the Milwaukee company's bus lines were self-supporting.

Mr. Budd said that the reaction of the people to the bus is very remarkable. They will champion the agency which gives them the service first, and if that is the railway then it goes to the railway's credit.

The next meeting will be held on July 18 at 2 p.m., at or near Cedar Point, Ohio.

# The News of the Industry

## Wage Offer Refused

### Cleveland Railway President Promised Three-Cent Increase—Open Shop Basis Alternative

John J. Stanley, president of the Cleveland Railway, on June 17 made the motormen and conductors of his lines a new wage settlement offer. The proposal from Mr. Stanley followed the threat of the men to strike because the company had refused to grant them a wage increase of 12 cents an hour, as determined by a board of arbitration. The company characterized the finding of the board as "fraudulent." Mr. Stanley offered the men a rate of 57 cents an hour for the first year, 60 cents an hour for the second year, 61 cents an hour for the third year, 63 cents an hour for the fourth year, 65 cents an hour for the fifth and each succeeding year of service, with 10 cents an hour additional for all motormen and conductors acting as instructors of new men. The company's present wage scale calls for 55 cents an hour for the first three months of service, 58 cents an hour for the next nine months and 60 cents an hour after the first year.

The executive committee of the union voted unanimously to refuse the company's offer. Mr. Stanley was so informed at a meeting on June 18, and asked if he had any further concessions to make. He replied in the negative.

"This is my final offer," said Mr. Stanley. "It either must be accepted or I shall operate on an open shop basis, in accordance with the notice we had posted in the carhouses last Saturday."

William Polk, president of the union, said: "Things look dark."

It was the general opinion that the car men were likely to call a strike not later than Aug. 21.

Mr. Stanley said that if the men accepted this offer he would resume contractual relations with the union. If the men refused the offer it is said that the company will operate on an open shop basis.

Because of the men's refusal to meet Mr. Stanley before 10 o'clock on June 14, the company posted notices in all carhouses that dating from that time the company was being conducted on an open shop basis. Mr. Stanley said that the refusal of the union officials to discuss wages with him abrogated their contract.

It was expected that the posting of this notice would precipitate a strike, so the City Council brought Mr. Stanley and the officers of the union together. This meeting resulted in the men and Mr. Stanley agreeing to a truce of one week.

In a communication to the City Council on June 16 Mr. Stanley said he would be willing to have a new board of arbitration go over all the evidence submitted at the recent arbitration. He suggested that the new board consist of City Manager Hopkins, Mayor Townes and Federal Judge Westenhaver or an appointee of Judge Westenhaver. Mr. Stanley stated that he would abide by a decision of this board, but that to meet any award this board might grant, the City Council would have to raise the rate of fare, which is now limited to 6 cents by the Tayler grant.

Both Mr. Hopkins and Mayor Townes refused to act as arbitrators. The letter was not without good results, however, for it resulted in the resumption of the direct negotiations between the men and Mr. Stanley.

When the men received Mr. Stanley's offer, they asked for further time so that the union's executive board might decide whether to lay the matter before the entire union membership.

## Tacoma Mayor Offers Fare Schedule

The latest development in the effort of the city officials to secure a 5-cent fare on the lines of the Tacoma Railway & Power Company, Tacoma, Wash., is the submission to the company of a proposal, framed by Mayor A. V. Fawcett, who heads the fight for lower fares. The Mayor has the united support of the Council to his proposal, which contains provision for an experimental period of revised fares. The proposal takes the form of an ordinance. The Mayor submitted it after he had refused to approve an ordinance proposed to the city by the Tacoma Railway & Power Company.

Mayor Fawcett's ordinance provides that the company will file and put into effect a six months' experimental tariff with the Department of Public Works at Olympia providing for fares as follows: Cash fare, 10 cents; weekly pass, $1, school tickets, forty for $1; tokens, twenty for $1, good for single ride. No transfers are to be given on tokens except on outbound cable cars, inbound cars on Twelfth Street line, North K Street line, South K Street line, and North and South Tacoma Avenue line.

It stated that the company might substitute buses for railway lines or supplement its railway service with buses.

The proposition submitted by the company, which Mayor Fawcett failed to approve, provided for twenty tokens for $1, continuation of the weekly dollar pass and a 10-cent cash fare. It also provided that if, under the administration of a proposed co-operative committee, the street railway fails to make a profit in two months the city tax its net instead of its gross revenue; if at the end of another three months the system is still losing, the fares be readjusted until a profit is shown.

## Seeks Ten Cents

### Poughkeepsie Company Would Raise Rates from Eight Cents and Discontinue Commutation Tickets

Application has been made to the Public Service Commission by the Poughkeepsie & Wappingers Falls Railway for permission to increase its cash fare within the city of Poughkeepsie, N. Y., and the village of Wappingers Falls and the fare zones between these places from 8 cents to 10 cents. The company also requests that it be permitted to discontinue altogether its monthly commutation tickets and to make certain additional charges for chartered cars. Fares now collected from school children are to be permitted to remain unchanged.

On June 4 the company filed with the U. S. District Court a complaint against the existing rates, and asked for an injunction which would restrain the Public Service Commission and the Attorney General from enforcing the rates then in effect.

A hearing on the motion for a temporary injunction was held before Judge John C. Knox in Federal Court in New York on June 10. Charles G. Blakeslee, counsel for the Public Service Commission, appeared in opposition to the motion, stating that the commission would be willing to act immediately on any new petition of the Poughkeepsie & Wappingers Falls Company. Judge Knox reserved decision. On June 11 attorneys for the railway and the commission appeared before Judge Knox and attorneys for the railway moved that the case be discontinued. This was agreed to by the commission and the Attorney-General. Judge Knox ordered the case discontinued.

A writ of certiorari was granted by the Supreme Court on July 9, 1921, after the commission had refused the company's petition for a 10-cent fare, but had issued an order granting an increase in fare from 7 to 8 cents. The commission filed a return to the writ on Sept. 23, 1921, after which the railway took no further steps until April 10, 1924, when notice of argument for the term of Supreme Court commencing May 6 was served on the commission.

The Supreme Court action was discontinued on May 21, and on June 4 the Federal Court action was started.

In its new petition the railway alleges that the existing rates are insufficient to yield a reasonable compensation for the services rendered, are unjustly and unreasonably low, do not provide sufficient income so that necessary reservations can be made for surplus and contingencies, and that in effect they are confiscatory.

In support of its application for a 10-cent fare the company places the probable original cost of its physical property at $1,207,613.98, including $35,000 for working capital. It estimates the fair and reasonable present value of the property at $1,600,000 exclusive of working capital, and the reproduction cost new at $1,900,000. It said the 8-cent fare granted by the commission in 1921 has failed to provide a net return of 8 per cent on the rate base established at that time.

## P.R.T. Bus Ordinance Up to Commission

The bus ordinance of the Philadelphia Rural Transit Company, a subsidiary of the Philadelphia Rapid Transit Company, Philadelphia, Pa., passed recently by the City Council, was signed on June 16 by Mayor Kendrick. The measure grants to the Rural Transit Company a ten-year franchise for operating five lines of buses.

One line will operate the full length of Broad Street and another will ply between Broad and Sansom Streets and Sixty-third and Walnut Streets. A third will run between Germantown and Roxborough, and the fourth will cover a course from Bridge Street, Frankford, to Broad and Filbert Streets, by way of the Roosevelt Boulevard, Twenty-ninth Street and the Parkway. The fifth route will serve the far northeastern section, including Frankford and Somerton. The next step will be the submission of the franchise ordinance to the commission for approval.

## Tentative Agreement Not Approved in Cincinnati

W. Kesley Schoepf, president of the Cincinnati Traction Company, Cincinnati, Ohio, has declined to approve certain provisions in the tentative agreement reached between the city of Cincinnati and the Cincinnati Street Railway, lessee of the system, for settlement of Cincinnati's traction situation. Mr. Schoepf explained that he was opposed to the provision calling for the appropriation of $30,000 annually for the maintenance of the office of the Director of Street Railroads and the method adopted for the repairing of streets in which rails are laid.

With reference to the Street Railroad Director's office, Mr. Schoepf said that he was opposed to the provision on general principles. He asserted that the money for the upkeep of the office would come out of the car riders' pockets. The office at present costs the city approximately $18,000 a year. Regarding the repair of streets between the rails, he said that the company operating the system should have full jurisdiction over the work. The agreement provides that the city perform the work at the cost of the operating company. The proposal provides for a 7½-cent car fare for three years and a capitalization of $28,000,000 for the operating company among other things.

The proposition is subject to the approval of the Mayor's traction committee and directors of the Cincinnati Street Railway. The matter will not be submitted to the directors of the Cincinnati Traction Company, in view of the fact that Mr. Schoepf is not in accord with all the provisions.

## Economies in Toledo Approved

A program of economies estimated to save about $500,000 annually in the operation of the Community Traction Company system at Toledo has been agreed upon by members of the board of control. Among the proposals for putting the system back on a profitable basis without raising fares beyond present rates are the following:

Abandonment of the Indiana Avenue line at a saving of $54,000 annually. This has been before the Council on a previous occasion but was turned down. The Mayor will propose abandonment so that it can be acted upon by June 23.

Elimination of bus competition in the city limits at a saving of $100,000.

Extension of one-man car operation to include 30 per cent of the lines at a saving of $150,000 annually.

Rearrangement of schedules on all lines at an estimated saving of $136,000 a year.

Placing a new power rate in effect which would save the railway $76,000 a year without jeopardizing the case of the city or the company now before the State Public Utilities Commission.

The decision in the power case is expected very soon. If the state commission refuses to take jurisdiction then the city's action in Common Pleas Court will go forward. Through this case the city is attempting to secure a refund of $200,000 alleged overcharge for power from the Toledo Edison Company, under the contract in the Milner ordinance.

## Buses Ruled Out at Duluth

Voters of Duluth, Minn., at a special city election on June 16 adopted an ordinance to regulate buses, the practical effect of which will be to bar local buses from the use of the streets. The vote was 10,354 for and 7,639 against, with ten precincts missing. The ordinance provides that all motor vehicles carrying passengers for hire, except taxicabs, vehicles engaged in the livery business and buses operated between Duluth and other municipalities, shall be prohibited from operating upon any street where double street car tracks are maintained. The Duluth Street Railway was active in the campaign in favor of the adoption of the ordinance.

## Identification Cards in Muscatine Advanced Fifty Cents

The price of car rides for patrons using monthly identification cards in Muscatine took a jump when the City Council, by a vote of five to two, granted the Clinton, Davenport & Muscatine Railway permission to raise the rate for cards from 50 cents to $1 a month. The new rate is an average increase of from 6 to 7 cents for patrons using at least fifty tickets each month. Fare without tickets remains at 10 cents.

The company has agreed to continue workmen's and children's tickets. Permission was also granted the company to resurface between the tracks on Mulberry Avenue from Second to Seventh Streets, the work to be the same as that done on Second Street, on the condition that the workmen's monthly tickets, now sold for 5 cents and good only two hours in the morning and two hours in the evening, be continued instead of abandoned as proposed by the company, and that the tickets giving children two rides for 7 cents remain the same instead of being discontinued, as asked by the company.

## Increased Wages in Springfield, Mass., May Mean Higher Fares

With a view to adjusting the income of the Springfield Street Railway, Springfield, Mass., to the requirements imposed by the arbitration award of June 11, when an eight-hour day and increased pay were granted to the employees, President Clark V. Wood and Vice-President Howard R. Whitney of the company met with Mayor Edwin F. Leonard and the transportation committee of the City Council June 16 and discussed tentative plans to increase fares from 7 cents to 10 cents, with tickets at reduced rates. For tickets a three-for-a-quarter rate is under consideration. The price for school children's tickets would be brought to 5 cents, as against 3½ now.

Reports that a sweeping introduction of one-man cars in the city was imminent were denied by President Wood. He said that present plans called for a maximum of fifty such cars in use at any one time, as against thirty-five at present. On some of the one-man cars two operators will be employed during the busiest periods.

Plans of the company, President Wood explained, look to bringing in $300,000 more revenue yearly. He said that owing to the business depression the gross income of the Springfield company during five months and twelve days had dropped $138,815, while the back pay of the men under the recent award will amount to $129,000. Mayor Leonard and Chairman John D. Shuart of the transportation committee expressed the view that it would be better for the public to have the fares increased than to have the service curtailed.

## Wage Issue Deadlocked

Negotiations looking toward a settlement of wages affecting the employees of the Connecticut Company, New Haven, Conn., have been going on for some time with the result that the employees and officials are deadlocked, although the agreement relating to working conditions has been signed.

It developed that in an effort to bring about a settlement of the question of wages, the conference board recently submitted for referendum vote the question of giving the board power to go to the company with a proposition to sign up the agreement for an increase of 1 cent above the present scale, making it 58 cents an hour instead of 57. The referendum vote refused to give the conference board this authority and so matters stand just as they were, the trolleymen not receding from their demands for 75 cents an hour for operators of two men cars and 90 cents an hour for one-man car operators.

The Connecticut Company insists existing conditions demand that wages be permitted to stay where they are and the conference board is without authority to do anything but insist on the 75-cent wage agreement.

## Detroit Must Arbitrate

### Circuit Court So Rules in Wage Case—City Announces Appeal—Negotiations to Continue

Circuit Court Judge Theodore J Richter on June 13 granted the mandamus asked by the union in Detroit to compel the Detroit Street Railway Commission to arbitrate differences regarding wages and working conditions. Plans were made immediately by the commission to appeal the case to the Michigan Supreme Court. The D. S. R. management will also proceed with its plans to deal with the rank and file of platform men through the employees' committee elected by the men in the carhouses. It has been announced by the commission that it will continue to ignore the union pending the Supreme Court ruling.

The writ ordering arbitration in the controversy was asked by the men following the failure of their union officers to gain recognition from the street railway management or to secure acknowledgment of or action on the demands submitted. The mandamus proceedings allayed the threatened strike and several months may elapse before the Supreme Court hands down a decision. In the meantime the railway management will proceed with its negotiations with the men through the employees' committee.

It is expected that the charter clause providing for the arbitration of disputes between the commission and its men will be one of the points of attack by the attorney for the commission. Attorney Wilcox, for the city, held that this provision is unworkable and unconstitutional. The clause in the city charter is as follows:

> In case of a dispute over wages or conditions of employment, said board is hereby authorized and directed to arbitrate that question or questions, provided each party shall agree in advance to pay half of the expenses of such arbitration.

Judge Richter stated that he would have hesitated to hold the charter provision good were it not for the fact that the commission arbitrated with the men in 1923. This, he said, gave a practical construction to the charter provision.

The questions involved in the matters before the court were outlined by Judge Richter in his opinion as follows:

> 1. Do the petitioners in this case duly represent the platform employees of the Department of Street Railways in, as is designated in said resolution of Feb. 7, 1923, their associated capacity?
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> 2. Is there an arbitration provision in the charter and is it workable?
>
> 3. Were proper demands made for the refusal of which mandamus will lie?

In his opinion the judge said in part:

> 1. That these petitioners truly represent the platform employees can, I think, hardly be questioned. Continuously since Feb. 7, 1923, they and their predecessors have without question represented the platform employees in their dealings with the Department of Street Railways and its managers. It is my judgment that within the provisions of the charter and within the provisions of the resolution of Feb. 7, 1923, and according to the course of conduct had between the platform employees on the one side and the Department of Street Railways on the other in the past, the petitioners here do in truth and in fact represent the platform employees.
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> 2. The charter provision does exist. It provides for arbitration when disputes arise. This provision is a part of the same basic law creating the respondent commission. It was put in the charter for a purpose. It is true that the charter provision in and by itself does not provide the machinery of arbitration, but in the past, in recognition of the charter provision and in recognition of the necessity for the machinery, those in authority promulgated the resolution of Feb. 7, 1923, set up the machinery to be employed in arbitration and proceeded to arbitrate under it. The men are seeking to avail themselves of it. The department claims that it is not bound to arbitrate except as, when and how it chooses. It is my opinion that the course of conduct between the parties, and the proceeding since the promulgation of the resolution of Feb. 7, 1923, have provided the machinery which makes the arbitration provision in the charter effective, and I so hold.
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> 3. The demands were made on April 22, 1924. They were prompted in part by the request of the assistant general manager of the Department of Street Railways as to whether there would be any demands by the platform employees. This he wanted to know for the purpose of his budget. The demands were made at a time when the resolution of Feb. 7, 1923, was in full force and effect, and the respondents realized that, as shown by the testimony when they sought, on May 24, to rescind the resolution of Feb. 7, 1923. It is contended that the resolution of Feb. 7, 1923, is not binding upon the city without the approval of the Mayor or Common Council. This agreement of Feb. 7, 1923, is an employment contract with each employee working thereunder, providing for his working conditions and methods and means of adjusting them. It is not necessary that it be approved by either the Mayor or the Common Council.
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> It is next contended that the resolution expired under the terms of the arbitration award of Aug. 18. This is not true, as the arbitration award was made in pursuance of and became a part of it.

During the progress of the case the court suggested a means of arbitration which it believed would satisfy all. In furtherance of this suggestion the court granted the parties more than a week's time to agree. It says that it was from time to time informed by the attorneys for both sides that progress was being made toward a settlement and toward securing the means of arbitration. At that time the court had heard only a small portion of the testimony and had not heard the argument and had no opinion either way on the merits of the controversy, but believed that it had provided a suggestion which would have settled the question satisfactorily.

## Jamaica-Babylon Electrification Under Way

Actual work in connection with the Long Island Railroad's plans to electrify its double-track line between Jamaica and Babylon, a distance of 28 miles, began a few days ago with the installation of the ties used for holding the third rail. Over 30,000 of these ties have been ordered and they are now being delivered.

Orders for third-rail sections have been placed to the extent of about 6,000 tons, and a substantial tonnage has already been shipped from the steel mills. Jumper cable and conduits to be used at street crossings, third-rail insulators, protection board and fittings and other necessary third rail material have been ordered, including about 37,000 track rail bonds. Manufacturers have promised early delivery.

All poles, cross-arms and fittings for transmission lines have been ordered. Some of this material has been received and other consignments are now in transit.

Equipment for the six substations to be erected at Laurelton, Lynbrook, Freeport, Wantagh, Amityville and Babylon has been ordered and the construction of these buildings will commence in the near future.

Equipment has been ordered for changing the present system on the Montauk Division to Babylon.

With the exception of the substation buildings proper, the work will be carried on by the company's own construction forces.

## Final Hearing June 26 on Queens Line Fare Plea

General Lincoln C. Andrews, receiver, and officers of the New York & Queens Railway, Long Island City, N. Y., made formal request in person on June 19 to the Transit Commission for permission to charge an increased fare. Unless the commission consents, Justice Joseph Aspinall of the Queens Supreme Court has declared that on June 26 he will grant the receivers' petition for the scrapping of the lines and the forfeiture of the franchises.

General Andrews proposed that the lines should be permitted to exact temporarily a 10-cent fare from casual passengers, but that regular riders should have the privilege of buying company tokens at the rate of four for 25 cents, each good for a ride. The commission could determine after a trial of the plan just what would be a tariff at cost.

The final hearing will be held on June 26.

## No Large Scale Pennsylvania Electrification at Present

Plans for the electrification of the Pennsylvania Railroad from New York to Philadelphia, from Philadelphia to Washington and from Philadelphia to Pittsburgh are under way, according to a representative of the company, but the "general railroad situation and the inadequacy of available funds make improbable the beginning of electrification work on a large scale in the near future."

This statement was made as the result of inquiries concerning the connection between the Conowingo power development and the Pennsylvania Railroad. When the decision to build this $60,000,000 electrical plant was announced recently the statement was made that it was to be used in supplying power for the Pennsylvania Railroad from Philadelphia to Washington.

Officials of the Pennsylvania did not deny the eventual possibility of an electrification, but they took the position that there is no telling when the plan can be carried out. The chief obstacle to such an improvement, it was stated on June 16, was the lack of funds.

## Will Substitute Buses

The Janesville Traction Company, Janesville, Wis., has informed the City Council that it will abandon service on its Washington Street line in favor of a bus system. The company states that this step would be more practical than paying for the extra cost of paving between its tracks on Washington Street, which section was included in the city's 1924 paving program. Incidental to this action, the company also has under consideration a proposal to extend its bus service through the Blackhawk district on the east side, which territory is without any public form of transportation at present.

## New Parking Regulations Proposed in Baltimore

New parking regulations covering all vehicles have been prepared for Baltimore by Charles D. Gaither, police commissioner, and submitted to Mayor Howard W. Jackson for his approval. The Mayor will make a study of the rules and if he approves them they will probably become effective on July 1. The United Railways & Electric Company and the bus companies operating in the city are much interested in the new rules.

One of the proposed regulations provides that no vehicle shall be permitted to stand longer than actually necessary to take on or discharge passengers, freight or merchandise on any street having tracks, within 75 ft. of any corner where cars take on or discharge passengers, or at any point where such standing vehicle may interfere with the free turning of a car from one street to an intersecting street, or with the free passage of any such street car along or across any street, or within 25 ft. of any intersecting curbs where there are no car stops, or opposite any safety zone, or within 20 ft. of the end of any safety zone. Another rule would use the trolley poles of the United Railways & Electric Company for the display of conspicuous signs setting forth the regulations at that particular point in the downtown section of the city.

Most of the rules deal with the business section of Baltimore. On some of the streets parking for a longer period than to receive or discharge passengers, freight or merchandise is prohibited entirely between 7:30 a.m. and 6 p.m. On others in the central section the prohibited hours are from 7:30 to 9:30 a.m. and 4:45 to 6 p.m. Parts of certain streets are designated as through streets with special parking regulations.

On many of the streets upon which it is proposed to make changes in the present parking rules the new regulations are not to apply on Sundays, holidays and after 2 p.m. on Saturdays.

## Veteran Employees of Bamberger Electric Made Directors

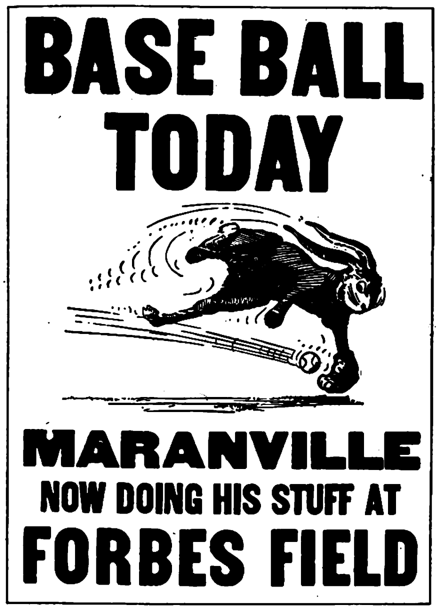
As a reward for their many years of service and in recognition of the knowledge they have gained during the long periods of practical experience in the operation of the Bamberger Electric Railroad, Salt Lake City, Utah, five veterans in the company's employ were recently named members of the board of directors. The combined term of service of these men with the road is 108 years. Their election to the board took place at the special meeting of stockholders held on June 3.

The veterans named as directors are: John W. Walsh, vice-president, eighteen years of service; J. B. Bean, secretary, twenty-six years; N. S. Wiltsie, general superintendent, fifteen years; R. B. Needham, traffic manager, sixteen years, and E. A. Vail, chief engineer, who has been with the company for the past thirty-one years.

Julian M. Bamberger, president and general manager, was chosen to serve with Mr. Walsh and Br. Bean as a director for three years. Mr. Walsh was named vice-president and Mr. Bean secretary. Mr. Wiltsie and Mr. Needham will serve on the board for two years, and former Governor Simon Bamberger, treasurer of the company, and E. A. Vail will serve one-year terms.

## Pittsburgh Baseball Dashers Have Dash

"If it doesn't draw attention it isn't an advertisement." This is a well-known advertising axiom very often overlooked. Not only is it the motto of the commercial department of the Pittsburgh Railways, but it is put into practice by the company. In calling attention to ball games many electric railways have for years been content to run "Baseball Today" or some similar calm statement on the dashers, ignoring the popular appeal in the personalities of the players. Every league team has stars at bat or in the field, or both, who are good copy. In the case of the Pittsburgh Pirates "Rabbitt" Maranville is known all over the circuit for his antics on the field and as a sterling player, bar none. It is intended to use this player personality for striking publicity just as the stars in the movies or theatrical world are played up by house owners as drawing cards.



Caricature Picturing "Rabbit" Maranville in Action

Probably twenty-five men, or whatever the player limit is, will still be cavorting about on Forbes Field by the middle of the summer. They will represent the survival of the fittest in a hard competitive test. A few rookies and many oldtimers will find themselves battling side by side. As the season goes on memories of the fans about the personalities of the older men will be revived by the railway in its posters and striking characteristics of the new players will be presented. Ball players are human. They crave praise. The act of an individual now and then among them may arouse censure, but by and large ball players are a very human lot, prompted by the same hopes, desires and ambitions that characterize humanity in general.

So the Pittsburgh Railways has started with Maranville as the first subject of its posters. Other players will be pictured skillfully in characteristic poses. The cost of the posters with the distinctive appeal is very little, if anything, more than that of the non-illustrated kind. As between the appeal that pulls and the mere formal announcement the Pittsburgh Railways found that the management of the Pirates, which pays the bill for the posters, fell in with the new idea at once and heartily.

## Springfield Jitney Men Pin Hope on Political Overthrow

Judge Wallace R. Heady at Springfield, Mass., has continued from day to day the cases of Thomas M. Brunton and George Mallis, convicted jitney drivers.

Richard J. Talbot, counsel for the jitney men, says it would be possible for the bus men to take their case to the Supreme Court and ask for a decision on the right of the transportation board to issue licenses, but with the City Council in its present condition, they would have little to gain by the move. He believes that the question whether the independent buses are resurrected lies now wholly with the voters, and he looks to the coming municipal elections to change conditions.

Mr. Talbot issued a statement in which he said:

> The right of appeal does not arise upon a continuance from day to day, but only if and when a case is finally disposed of by sentence. I do not anticipate any disposition which will make an appeal advisable, for the bus operators have followed the suggestion of Judge Heady and discontinued operation.
>
> The court has not decided that the free operation of a bus is unlawful. We have never contended that unlicensed buses could be operated for hire and did not anticipate that the public would refuse to ride free during the period of protest.
>
> If bus service is to be restored it must be under settled conditions which will allow the operators to replace their vehicles with up-to-date equipment worthy of this progressive city. The privilege of granting such a right rests with the people through their chosen representatives. Unless that right is made secure by the present officials, or the City Council to be elected in December, no operator will invest his funds in expensive equipment. We have made the best fight that we knew how to make against forces the strength of which no man of experience will underestimate.
>
> The problem of restoring service is now with the voters, who I believe will vote as they talk. If they do the restoration of independent bus service is only a matter of time.

## Settlement Agreement Reached in McKeesport

The city of McKeesport has settled claims against the Pittsburg Railways amounting to $100,000 on the basis of the payment of $75,000. The terms of the settlement include an agreement on the part of the railway to do considerable paving in the city within two years.

The agreement provides for payment by the company to the city of $25,000, within thirty days, the remainder, $50,000, to be paid in ten equal installments without interest. The city is to discontinue all suits against the company and to accept $5,000 a year as a franchise tax, instead of $10,000 a year, for three years, including the current year, after which a new agreement may be made. The railway is to make certain improvements during 1924 and 1925. The terms of the agreement are subject to approval by the Public Service Commission.

The agreement ends a long fight. The franchise tax alone amounted to $66,000. It accumulated while the company was in the hands of receivers, when the United States District Court refused to order receivers to make payment to the city.

## News Notes

**Publication Reappears.**—The United Railways "Bulletin," published monthly for distribution among the employees of the United Railways, St. Louis, Mo., made its reappearance with the June issue after six months of suspension due to the death of its editor, William Vincent Brumby. The new editor is R. C. Rogers.

**Bus Service Extended.** — The Winnipeg Electric Railway, Winnipeg, Canada, will put two new bus services in operation. One of these services will operate on Archibald and Provencher Streets in St. Boniface and the other will serve territory on St. Mary's Road.

**Sunday Excursions Advertised.**—The Kentucky Traction & Terminal Company, Lexington, Ky., is arranging Sunday boat-trolley trips this summer. The round trip rate of $1 includes a 34-mile boat ride along the Kentucky River and a 56-mile trolley ride through Lexington and Frankfort. The company is advertising the trip extensively.

**Conferences on Wages.**—The Boston Elevated Railway, Boston, Mass., is engaged in daily conferences with representatives of the carmen's union about wages and working conditions. The men have submitted a demand for an increase of about 25 cents an hour, raising the maximum to 95 cents an hour, and the company has requested the men to take a reduction of 5 cents an hour. There are other conditions involved, such as a six-day week and vacations.

**Special Excursions to Celebrate Rehabilitation of Indiana Road.**—A novel traction trip for the purpose of acquainting patrons of the line with new cars and other facilities recently put into service was made recently by the Indianapolis & Cincinnati Traction Company on the Greensburg division. The excursion was offered at 50 cents for the round trip, any distance, either direction and on all trains. Not more than seventy-five passengers were permitted on any one car. A similar trip on the Rushville division is planned soon. Special permission was granted the company by the Public Service Commission to make the reduced charge for the day. On June 16 officers and invited guests were taken over the road in a special car to celebrate the rehabilitation of the line. The tour was in the nature of a twentieth anniversary and marked the completion of the change-over in operation from alternating to direct current.

**"Rylite" Chosen.**—The name of the new magazine which is to be published monthly by and for the employees of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., is the *Rylite Employees' News*. J. H. Pritchard submitted the accepted name. He will receive the $25 prize. Mr. Pritchard is employed as distribution superintendent in the line department. The contest for a name was started in May. In all 321 entries were received. The company has now started another contest offering $20 in cash prizes to employees for the best constructive suggestions.

**Freight Business on the Increase**—A recent report made public by the Illinois Traction System, Peoria, Ill., operating the largest electric trunk line railway in the world in Illinois, shows that during the year 1923 the road handled 46,067 cars of freight, representing close to 1,850,000 tons. The freight business of the system has been steadily increasing from year to year. In 1921 the system handled 32,000 cars and in 1922 a total of 37,000 cars were hauled.

**Permit Granted.**—The Atlantic Coast Transportation Company, a subsidiary of the Atlantic Coast Railway, Asbury Park, N. J., has been granted a permit to operate at that place and also to operate a double-deck sightseeing bus. The company will establish a terminal at the foot of Asbury Avenue, Asbury Park.

**Gets Increased Fare.** — The City Council of Colorado Springs, Col., has sanctioned the Colorado Springs & Interurban Railway's plea and awarded a 10-cent fare but added a proviso that the company must issue weekly passes costing $1.25 each. These tickets are good for as many rides as the holder cares to make during the week specified. The Council's grant will be effective after approval by the State Public Utilities Commission. President Strickler had notified the city officials that unless the company was permitted to increase its fare it could not operate; that a 10-cent fare was absolutely necessary.

**Wants to Operate Boston-Lowell Bus Line.** — The Eastern Massachusetts Street Railway, Boston, Mass., has applied to the Massachusetts Department of Public Utility for permission to operate buses from Park Square, Boston, to Lowell, Mass. The department several weeks ago granted a general order to the road to operate buses under which the company must apply for specific routes. The bus trip between Boston and Lowell will be made in less than an hour and a half and the fare for a single ride will be $1.

**Consideration for Public Wins Praise.**—In constructing a strip of new track past the police station, city hall, county building and business establishments the Grand Rapids Railway, Grand Rapids, Mich., is making special efforts not to interfere with traffic during the period in which the street is torn up. This effort brought commendation in the Grand Rapids *Press* of June 5 under the caption, "Considering Traffic on Street Jobs."

**City Council Favors Increased Rates.**—The Eugene City Council has adopted a resolution petitioning the Oregon Public Service Commission to grant the Southern Pacific Company a 7-cent fare on its railway lines in Eugene, Ore., an advance of 1 cent, and to authorize the company to sell four tickets for 25 cents. In return for this resolution the company agrees to put in standard concrete pavement between the tracks of its lines at any place in the city where streets on which its lines extend are to be paved in the future.

**Seeks Increased Fares.** — Increased cost of transportation and decrease of patronage were cited by Frank H. Shaffer, attorney for the receiver of the Cincinnati, Lawrenceburg & Aurora Electric Street Railroad, before the Cincinnati Council committee on street railroads for an increase in the cash fare from 7 to 10 cents. The ticket rate of 6¼ cents is to be continued. The rate of fare is for that section of the system between Anderson's Ferry and the west corporation line of Cincinnati. The existing rate of fare expires on July 9 and the interurban company seeks a new rate for the next two years. Residents of the district served by the traction company informed the Council committee that they preferred a 7½-cent ticket rate and 8-cent cash fare. Mr. Shaffer, however, informed the committee that the 10-cent cash fare would be paid only by the excursionist and the casual rider. The question was taken under consideration by the committee.

**May Operate One-Man Cars.** — The Reading Transit & Light Company, Reading, Pa., has applied to the Public Service Commission to set aside the general rule which requires a member of the crew to alight and proceed ahead of the car at points where the railway tracks cross steam railroad tracks. It is said that abolition of this ruling will result in the operation of one-man cars in Lebanon.

**Buses Permanently Enjoined.**—Vice-Chancellor Buchanan at Trenton, N. J., recently made permanent the injunction against George Zellers, Sr., George Zellers, Jr., Frank Sidone and Louis Annello operating their buses on a route paralleling the line of the Millville Traction Company, Millville, N. J. The proceedings were instituted by the Board of Public Utilities Commissioners, which had issued orders directing that the defendants cease operation, but which was ignored. The injunction proceedings in the Court of Chancery followed. Annello was also charged with violating the order of the Chancery Court and he was cited to show cause why he should not be adjudged in contempt. Appearing for the commission on June 3, Thomas Brown said that counsel for Annello admitted that he was guilty of a violation of the court's order in that he had operated on the line of the railway for a distance of 300 or 400 ft., but did not take on or discharge passengers on the railway route. There was no intention, according to counsel for the defendant, to ignore the spirit of the order. The court adjudged Annello guilty of contempt and fined him $25.

# Financial and Corporate

## Market Street Net $1,195,566

### San Francisco Road Shows Increase of 18 per Cent in Net Over 1922 —Gross Up 2.35 per Cent

During the year ended Dec. 31, 1923, the gross earnings of the Market Street Railway, San Francisco, Cal., showed a susbtantial increase over 1922, with the exception of the earnings for the month of June, which were approximately $25,000 less than June, 1922. This was principally due to the fact that during June, 1922, the Shriners held their large convention in San Francisco, which it was estimated increased the receipts for the month by more than $30,000.

The increase in gross earnings for the year was 2.35 per cent. It is attributed principally to the normal increase in the population of San Francisco, although the increased use of automobiles has affected adversely the rate of increase in the gross earnings.

On April 29, 1923, there was a horizontal increase in the wages of the platform men. This is reflected in an increase of $112,450 over 1922 in the cost of conducting transportation and traffic. Offsetting this, however, was a decrease in the cost of power amounting to $96,251. The total operating expenses for the year were $12,596 less than for the year 1922, and the net income from operation after all charges including interest on the debt, but before deduction for federal income tax, increased $272,884 or in excess of 18 per cent over the preceding year.

Notwithstanding the increase in the wage scale the labor turnover for the year was materially greater than in 1922, principally accounted for by the fact that industry generally in California was much more active and the demand for labor considerably greater than during the preceding year.

STATEMENT OF INCOME AND PROFIT AND LOSS OF MARKET STREET RAILWAY FOR THE YEAR ENDED DEC. 31, 1923

| | | |
|---|---|---|
| Operating Revenue: | | |
| Passenger | $9,747,376 | |
| Other | 62,016 | |
| Total | | $9,809,392 |
| Operating Expenses and Taxes: | | |
| Operating Expenses: | | |
| Maintenance of ways and structures | $587,487 | |
| Maintenance of equipment | 640,938 | |
| Power (including disputed charges) | 1,346,159 | |
| Transportation and traffic | 3,507,318 | |
| General and miscellaneous | 754,345 | |
| Total operating expenses | $6,836,247 | |
| Taxes (other than Federal income taxes) | 617,100 | |
| Total operating expenses and taxes | | $7,453,347 |
| Net operating revenue | | 2,356,045 |
| Other income credits: | | |
| Interest and dividends | $63,197 | |
| Other | 11,356 | |
| Total | | 74,553 |
| Gross income | | $2,430,598 |
| Income charges: | | |
| Interest on funded debt | $727,457 | |
| Depreciation of railroads and properties | 320,000 | |
| Provision for 1923 Federal income tax | 153,578 | |
| Other | 33,997 | |
| Total | | 1,235,032 |
| Net income for the year | | $1,195,566 |
| Surplus, Jan. 1, 1923 | | 846,042 |
| Profit and loss credits: | | |
| Cancellation of reserve for undeposited United Railroads of San Francisco bonds in reorganization agreement | | $263,000 |
| Profit on purchase and sale of company's securities—Net | 22,139 | |
| Other | 921 | |
| Total | | 286,060 |
| Gross surplus | | $2,327,670 |
| Profit and loss charges: | | |
| Dividends on prior preference capital stock | $697,200 | |
| Federal income taxes for year 1922 | 138,682 | |
| Refinancing expenses | 50,826 | |
| Other | 9,465 | |
| Total | | 896,173 |
| Surplus, Dec. 31, 1923 | | $1,431,496 |

OPERATING STATISTICS OF MARKET STREET RAILWAY FOR YEAR ENDED DEC. 31, 1923

| | |
|---|---|
| Passengers carried: | |
| Cash fares 5c each | 193,331,018 |
| Special car passengers | 31,025 |
| School and other tickets, 2½c | 3,135,831 |
| Other tickets, 5c each | 17,176 |
| Total revenue passengers | 196,515,450 |
| Free transfer passengers | 63,761,055 |
| Total revenue and transfer passengers | 260,276,505 |
| Free passes | 583,736 |
| Total passengers | 260,860,241 |
| Percentage of transfer passengers to revenue passengers | 30.82 |
| Passenger revenue per revenue and transfer passengers, cents | 3.75 |
| Car hours | 2,821,324 |
| Car miles | 25,391,329 |
| Miles of single track leased, etc | 18.51 |
| Miles of single track owned | 256.27 |
| Miles of single track operated | 274.07 |
| Number of passenger cars owned | 749 |
| Per Cent of Operating Revenue | |
| Operating expense | 69.67 |
| Taxes (railway only) | 6.29 |
| Operating expense and taxes | 75.96 |
| Operating income | 24.04 |
| Non-operating income | .76 |
| Gross income | 24.80 |
| Deductions from income | 7.47 |
| Net income | 17.33 |

The company reports no deferred maintenance work. In addition to the ordinary repairs and replacements more than 24,000 ft. of single track were reconstructed and more than 33,000 sq.ft. of new asphalt surface laid, and more than 220,000 sq.ft. reconstructed. Approximately 50 per cent of the number of cars operated daily passed through the shops for general overhauling, and in addition, sixteen new car bodies were built and put into operation, thus adequately taking care of the increased travel.

It was deemed advisable to increase the capacity of the substations of the company so as to take care of the normal demands for power which may be anticipated for at least two years.

In December negotiations were started for the refunding of the $9,250,000 of 5 per cent first mortgage bonds and the $4,250,000 of 6 per cent collateral trust notes, both of which issues fall due in 1924. These negotiations culminated in the sale of $13,000,000 of 7 per cent first mortgage bonds, the proceeds utilized for the refunding of the old debt. The only funded debt outstanding now is the issue of $13,000,000 of 7 per cent bonds.

Charles N. Black, president of the company, says that the negotiations for the purchase of the company's property by the city of San Francisco have been carried on more or less spasmodically during the past year, but little real progress has been effected.

## Lake Shore Power Controls Toledo & Indiana

Through the exercise of an option secured a few weeks ago the Lake Shore Power Company, recently incorporated at Toledo, now controls the Toledo & Indiana Railroad, operating between Toledo and Bryan, Ohio. The interurban line and the electric properties will be separated under the new ownership. The Lake Shore Power Company controls the Central Light & Power Company of Williams County, the Wauseon Light & Power Company and several subsidiary distributing systems in nearby small towns.

Officers of the Toledo & Indiana Railroad are now L. G. Van Ness, Cincinnati, president of the Maumee Valley lines and of the Cincinnati, Georgetown & Portsmouth Railroad; Charles T. DeHore, Cincinnati, of the General Electric Company, vice-president; LeRoy E. Eastman, secretary and general counsel; and Marion M. Miller, president of the Home Bank & Trust Company, treasurer.

Directors are Judge Jason A. Barber, Toledo, who served for many years on the board; L. H. Schroeder, vice-president of the Central Trust Company of Illinois, Chicago; James W. Marshall, vice-president of the Chicago Trust Company; L. B. Breedlove, chief engineer of the Chicago Trust Company, Chicago; A. B. Gebhart Bryan, and the officers of the company.

With the exception of Mr. Breedlove the same men are officers and directors of the Lake Shore Power Company.

The new interests control all but $36,000 of the $1,400,000 outstanding Toledo & Indiana stock.

## Stock Sales to Employees a Success in Chicago

The campaign for the sale of $1,000,000 of prior preferred stock to the employees of the Chicago Rapid Transit Company, Chicago, Ill., has gone over the top and at the latest count the total sales amounted to $1,294,100 to 5,136 employees.

The second division of the stock sale, by which the company undertakes to sell $4,000,000 in stock to the Elevated riders, is now under way, with every employee of the company a salesman. The daily newspaper being published during the campaign points out that with all the employees working the issue would be exhausted if each employee sold eight shares.

Of the total employees who purchased shares, with a dividend rate of 7.8 per cent, 794 subscribers paid in cash for 2,987 shares. The deferred payment sales amounted to 9,954 shares to 4,342 employees. Of the 5,700 employees of the company, it will thus be seen that only a few hundred did not take advantage of the company's offer to purchase at least one share of stock. The average holding of the employees, acquired during the campaign, amounts to slightly in excess of 2½ shares per employee.

The third issue of the second volume of the "Stock Sale News," which has been published daily during the campaign, contained this announcement:

> The board of directors of the Chicago Rapid Transit Company, at a meeting held Wednesday, June 11, declared the first quarterly dividend since the reorganization of the companies. This dividend will be paid at the rate of 65 cents a share on the first days of July, August, and September to stockholders of record on the third Tuesday of the preceding month. This dividend is at the rate of $7.80 a share a year.

## Birmingham Employees Buy 959 Shares in Three Weeks

Within three weeks after the plan was started approximately one-third of the employees of the Birmingham Electric Company, Birmingham, Ala., had subscribed to preferred stock of the company. Subscriptions are continuing and four departments, it is stated, have already subscribed 100 per cent, that is, each member of the department has taken at least one share of stock.

On June 17 three weeks after the preferred stock was first offered to employees, a total of 959 shares had been subscribed. The stock is no par value cumulative preferred and carries a dividend at the rate of 7 per cent a year. It is being sold to employees for cash at a price of $92 a share. On time payments the price is $97 a share, but after the first payment has been made, it is stated, dividends are paid at the regular dividend dates and no interest is charged on deferred payments.

Under the plan adopted, each employee may purchase up to ten shares of the stock, but not more than ten. Employees may, however, purchase up to ten shares for each member of their families, if they wish.

Daily bulletins are being issued showing the progress of the sales, and four of the seventeen departments have already reached 100 per cent in subscriptions. The Birmingham Electric Company has a total of 1,435 white employees, in addition to a number of negro employees. Several of the negro employees subscribed for from three to five shares.

In a letter to all employees of the company, published in "The Buzzer," weekly publication of the Birmingham Electric Company, J. S. Pevear, vice-president, expresses the hope that every employee will take at least one share of stock. He points out that the terms upon which it is offered are very liberal, and purposely so, for it is of benefit to purchasers of the company's securities to have the employees join them as investors.

"As owners of the stock," Mr. Pevear said, "we are going to look upon the company in an entirely different light, and aside from the satisfaction of having a good investment and the pride of partial ownership of the enterprise in which we are employed, we are also going to take a much greater interest in the daily conduct of its affairs."

## Receiver for Michigan Road

### Arbitrary Action of Village in Paving Matter Forces Representatives of Bondholders to Act

Stewart Hanley, Detroit, on June 17 was appointed receiver of the Grand Rapids, Holland & Chicago Railway, operating interurban lines between Grand Rapids and Holland. The action was taken on petition of the Continental & Commercial Trust & Savings Bank, Chicago, under the trust deed securing a $1,500,000 bond issue authorized in 1900. The receivership was precipitated, according to the petition, by the action of the village of Grandville in refusing to permit the company to operate cars through the village until the interurban has lived up to its agreement to pave between its tracks there.

Some years ago the village of Granville granted the railway company a franchise to operate cars over its streets, and with this franchise was an agreement on the part of the railroad to pave between the tracks when the village repaved the street and to use material in that paving similar to that laid by the village. About five years ago the village paved the street, but the company did not pave between the tracks, stating at that time that it could not obtain the material. Action by the village to compel compliance with the terms of the ordinance was delayed, but last year the village began suit in the Circuit Court at Grand Rapids to force the company to complete the work of paving. Judge Willis B. Perkins several months later granted the petition of the village and ordered the railroad to lay the paving. The company appealed to the Supreme Court of Michigan. That body upheld the findings of the lower court, refused the company's petition for a rehearing and ordered the company to begin paving by May 1 of this year.

On that date nothing had been done, but the village granted a thirty-day extension of time. On Saturday June 14, it took further action by erecting barricades at the village limits so as to block cars both east and westbound through the village. Passengers were thus forced to walk the mile stretch in the village.

Receiver Hanley in sixty days will report back to the court as to the progress. The company admitted all allegations in the bill and joined in the prayer for a receiver.

On the evening of June 17 the village had begun to lament at the consequences of its arbitrary action. It lifted the blockade which for three days has prevented cars from passing through the village. Service between Grand Rapids and Holland was resumed on regular schedule on June 18. Judge Sessions has stated he will authorize Mr. Hanley to issue receiver's certificates at once in order that money may be raised to pave between the tracks in Grandville this summer.

## Bus Purchase Reported at St. Louis

An agreement has been reached by the reorganization committee of the United Railways and the owners of the People's Motorbus Company, St. Louis, whereby the bus lines are offered to the successor to the reorganized railways for $2,400,000. The terms of purchase said to have been agreed upon are: Holders of Class A to be paid $60 a share, which means $5 for the first year of operation and $5 additional profit. A payment of $300,000 is said to have been offered for all of the B stock, which brings the total to $2,400,000.

The bus company is now operating seventy-two buses on five lines.

Further progress is reported toward lifting the railway receivership. The reorganization committee for the railway has decided that the $30,300,000 United Railways general mortgage 4 per cent bonds maturing in 1934 should be allowed to run to maturity. In order to avoid default in these bonds it will be necessary to cause the interest due last January to be paid on or before July 1, 1924, as the mortgage permits a delay of only six months. This interest will be paid, together with 6 per cent for the use of the money during the past six months.

It is the opinion of the reorganization committee, publicly expressed, that the present bus system and the street railway system can be satisfactorily coordinated. The committee has no desire to see buses eliminated or to prevent expansion of the bus system.

As yet no settlement has been made with the Suburban bondholders, who are proceeding separately from other bondholders. It is expected, however, that it will be possible to effect a settlement by which the bondholders of the Suburban system can be protected and the system be maintained as a unit.

Both the city and the railway have appealed from the valuation handed down by the Public Service Commission of the State of Missouri. Here again it is hoped that a basis of settlement can be determined shortly through which the city will withdraw its opposition to the valuation, and the receiver of the railway will do likewise.

All these four matters are actively engaging the attention of the reorganization committee. They must be settled before any reorganization plans are definitely announced. It is hoped to determine all of them in the near future.

The Board of Aldermen of St. Louis, Mo., has turned over to its committee on resolutions a bill introduced by Alderman Wimer of the Twenty-seventh Ward which provides that the president of the board appoint a special committee of seven aldermen to interest themselves in negotiations being carried on for the reorganization. Mayor Henry W. Kiel has repeatedly stated that the city administration would not participate in the negotiations for the reorganization of the United Railways, but would await an application for a new franchise before indicating the city's attitude on the reorganization plans. The newspapers of the city have criticised the Mayor for this stand.

**Proceeds of Chicago Issue for Refunding.**—The proceeds of the sale of the $6,500,000 of Chicago Rapid Transit Company first and refunding mortgage gold bonds, referred to in the ELECTRIC RAILWAY JOURNAL for June 14, page 952, will be applied toward the retirement of $8,000,000 of first mortgage bonds of the South Side Elevated Railroad which mature on July 1, 1924.

**Receipts More than Expenses.**—The receipts of the Seattle Municipal Railway, Seattle, Wash., during the month of May totaled $519,502 and the disbursements $487,796.

**$1,000,000 First Mortgage Bonds Offered.** — Blodget & Company and Stone & Webster, Inc., New York, are offering at 93 and interest to yield more than 6 per cent $1,000,000 first mortgage 5½ per cent gold bonds of the Baton Rouge Electric Company, Baton Rouge, La. The bonds, known as series "A," are dated June 2, 1924, due June 1, 1954. The proceeds from the sale of this issue will be used to retire the existing debt of the company, including outstanding first mortgage bonds, called for payment on Aug. 1, 1924, and to provide additional funds for construction purposes. The Baton Rouge Electric Company does the entire electric lighting, power, gas and electric railway business in Baton Rouge.

**Abandonment Decision Deferred.**—Decision in the hearing before Commissioner Harry V. Osborne at the State House, Trenton, N. J. on the application of the Trenton & Mercer County Traction Corporation for the abandonment of service between Pennington and Hopewell was reserved for two weeks. In the meantime submission of the proposal will again be made at a public mass meeting to the Hopewell people and to the people residing within the affected districts. At that time a new plan will be submitted by the railway, which wants to operate buses between the two towns.

**Authorizes Abandonment.**—The Pennsylvania & Maryland Street Railway, Elk Lick, Pa., has been granted permission by the Public Service Commission to abandon its 5-mile line between Meyersdale and Garrett, Pa. The bridge material and trackage have been advertised for sale. The company has operated the trolley line since 1907, but with the improvement of the main highway between Meyersdale and Garrett and resultant bus service business on the railway fell off considerably.

**Bonds Called for Payment.** — All of the outstanding first mortgage 6 per cent serial gold bonds of the Portsmouth Street Railroad & Light Company, Portsmouth, Ohio, except $25,000 which mature July 1, 1924, have been called for payment July 1, at 102½ and interest, at the office of the Guaranty Trust Company. The total issue of the bonds is $325,000. They are dated July 1, 1914.

**Surplus in Rochester.**—The quarterly report for the operations of the New York State Railways for the period ended April 30, under the service-at-cost contract on Rochester trolley, trackless trolley and bus lines, shows a net surplus of $14,616 from combined operations. Although a steady gain in passengers is shown on the bus and trackless lines a deficit of $2,949 from the operations of the two lines is reported. The trolley surplus is $17,564. The Dewey Avenue Bus line, connecting the end of the Dewey trolley line with the suburb of Greece, and the crosstown trackless line, connecting a growing residential district on the south side of the Genesee River with the industrial area on the north side, are operated by a subsidiary company, the Rochester Co-ordinated Bus Lines, Inc.

**Vote to Omit Dividend Payment.**—The directors of the Rochester & Syracuse Railroad, Inc., Rochester, N. Y., recently voted to omit payment of the quarterly dividend on June 15 on the 6 per cent non-cumulative preferred stock. From March 15, 1921, to March 15, 1924, inclusive, quarterly dividends of 1 per cent were paid on this issue.

**Authorized to Execute Payment Deeds.**—The Key System Transit Company, Oakland, Cal., has been authorized in supplemental orders by the Railroad Commission to execute mortgages or deeds of trust to secure payment of $229,000 of first mortgage 6 per cent bonds due July 1, 1938, and $236,000 of similar bonds.

**Director Chosen.**—John P. Frenzel, an Indianapolis financier, was recently elected a director of the Indianapolis Street Railway, Indianapolis, Ind., to fill the vacancy caused by the death of Dr. Henry Jameson, formerly chairman of the board.

**Utah Interurban Had Profit in 1923.**—The Salt Lake & Utah Railroad, Salt Lake City, Utah, was operated during 1923 at a net profit of $69,449, according to the annual report filed with the Public Utilities Commission. The company paid $36,450 in dividends. Operating revenue was $877,461, an increase of $124,969 over the preceding year. Operating expenses were $532,811, an increase of $55,603 over 1922. Taxes on equipment and railroad property were $69,912 and interest on equipment notes and other outstanding notes was $160,400. The road's passenger revenue was $335,975, a gain of $12,386 over 1922. Freight revenue was $482,137 for last year, an increase of $100,817.

**Suffered Loss of $447.** — For the calendar year 1923 the Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan., suffered a loss in its balance account of $447. In 1922 the company realized a surplus of $21,318. Passenger earnings for 1923 were $232,222, against $247,636 in 1922. The total gross earnings were $461,819 in 1923 and $468,903 in 1922. Operating expenses showed an increase from $292,466 in 1922 to $312 399 in 1923. The line operates 40 miles of track, connecting Kansas City, Kan., Edwardsville, Bonner Springs, Linwood and Lawrence, with an additional 30 miles projected to extend to Topeka.

**Accumulated Surplus in 1923 $160,752.**—The Pacific Coast Railway, operating from Port San Luis, Los Alamos, Santa Maria and Guadalupe, reports to the California Railroad Commission for the year 1923 that its operating revenue was $162,541 and operating expenses $187,842, giving a net operating loss of $25,301. Miscellaneous non-operating revenue amounted to $59,589. Interest, rent, taxes and other deductions totaled $93,935. The net corporate loss for the year was $62,646. The surplus at the beginning of the year amounted to $223,858. Miscellaneous additions to surplus for 1923 amounted to $454 and miscellaneous deductions were $913, leaving an accumulated surplus at the end of the year of $160,752.

**Order of Dissolution Filed.** — The Empire United Railways, Syracuse, N. Y., has filed, through its attorney, with the Secretary of State an order for dissolution.

**Reorganization Plan in Effect.**—The holders of the first and refunding mortgage 5 per cent thirty-year gold bonds of the Buffalo & Lake Erie Traction Company, Erie, Pa., were recently notified that the reorganization committee had declared the plan of reorganization operative and effective. The reorganization plan was outlined in the ELECTRIC RAILWAY JOURNAL, issue of April 19, 1924.

**Bonds Sold.** — Drexel & Company, Philadelphia, have sold at 98 and interest to yield about 6.15 per cent, $3,000,000 of 30-year 6 per cent general mortgage gold bonds of the Georgia Railway & Power Company, Atlanta, Ga. The bonds are known as series of 1924. They are dated April 1, 1924, and are due April 1, 1954. In a letter from H. M. Atkinson, chairman of the board, it was stated that upon the completion of the new 20,000-kw. hydro-electric plant, which will be provided for from the proceeds of these bonds, the company will have a total hydro-electric generating capacity of 160,000 kw. The purpose of the issue in addition to the 20,000-kw. development is to pay for additions to the generating and distributing system.

**Permission Sought to Abandon Surface Routes.** — Final hearings on the application of the Dry Dock, East Broadway & Battery Railroad, New York City, to abandon a portion of its route and franchise on First Avenue from Fourteenth Street to Thirty-fourth Street and on the application of the Forty-second Street Manhattanville & St. Nicholas Avenue Railway to abandon a portion of its route and franchise on First Avenue between Forty-second Street and Thirty-fourth Street were held on June 9 by the Transit Commission. Decision was reserved.

**Abandonment Authorized.** — The Pennsylvania Public Service Commission has granted the Scranton Railway permission to cease operation from the boundary line between the Township of Lackawanna and the Borough of Moosic on the north, to the intersection of Main and Broad Streets in the city of Pittston, on the south. The commission said that in the light of the overwhelming and practically uncontradicted evidence with respect to the operating losses which had been sustained on the line for years; with respect to the additional capital which must be put into the system to place it in safe operating condition; with respect to the lack of necessity of continued operation of the line and to the adequate transportation facilities now serving the communities, it believed that the proposed abandonment was proper for the convenience of the public. The length of line abandoned is about 8 miles.

**Terms of Power Deal Reported Met.**—It is understood that so far as the owners are concerned the way has been cleared for the consummation of the deal under which the American Gas & Electric Company and the Appalachian Power Company are seeking control of the American Electric Power Company. One of the conditions of the offer of $62.50 a share for the common stock of the American Electric Power was that 75 per cent of the 189,200 shares be deposited for delivery to the purchasers against payment. This condition is understood to have been met. Several important railways are included in the holdings about to change hands. The most recent development publicly reported in connection with the deal is an intended inquiry into its terms by the Public Service Commission of Pennsylvania.

**Talk of Canadian Utility Merger.**—Plans are said to be rapidly developing for Montreal Light, Heat & Power consolidated interests taking over the entire group of Robert companies, including Quebec-New England Hydro-Electric Corporation, Canadian Light & Power Company, Montreal Tramways & Power Company and Montreal Tramways. It is proposed to form a holding company whose capital, it is understood, will be $20,000,000.

**Dissenting Stockholder Seeks Greater Consideration.**—Thomas E. O'Shea, a stockholder of record in the New York Railways, New York City, has petitioned the Transit Commission requesting that before proceeding further in its hearings upon the reorganization plan of that corporation the commission subpœna the Guaranty Trust Company to produce a list of the present holders of the company's refunding bonds. He asked also that "Harry Bronner's reorganization protective committee be compelled—through subpœna, if necessary—to disclose to the commission the names of the bondholders whom it represents, the number of bonds held by each bondholder, the dates of the purchase thereof and the prices paid by them in each instance." Stripped of its verbiage Mr. O'Shea's plea is a protest seeking greater consideration for the stockholders of the company under the terms of the proposed reorganization.

**Brooklyn Company's Preferred on Regular Basis.**—At the board meeting of the Brooklyn-Manhattan Transit Corporation on June 16 the second dividend of $1.50 a share on the preferred stock was declared, and it was learned that the company has adopted a policy of declaring regular quarterly dividends in the future. When the first preferred dividend was declared last April, the directors intimated that this first payment did not constitute the inauguration of regular dividends, but was more in the nature of interest on money contributed by the stockholders to make possible the reorganization. The company has made such progress, however, that it was able to place the shares on a regular dividend basis, the first of which has just been announced. Under the terms of the reorganization plan by which it succeeded the Brooklyn Rapid Transit the dividend on preferred shares does not become cumulative until July, 1925.

# Personal Items

## D. E. Blair Heads Canadian Association

### Engineer of Equipment at Montreal and P. A. Y. E. Designer Honored

D. E. Blair, who was elected president of the Canadian Electric Railway Association at its annual convention in Ottawa on June 13, is one of the ablest of the younger group of executives of Canadian electric railways. When asked to tell his life history Mr. Blair modestly replied that it could be told in a very few words. For the past twenty-one years he has been superintendent of rolling stock of the Montreal Tramways. Prior to 1903 he held a similar position with the Quebec Railway, Light, Heat & Power Company, which he joined in 1897, immediately after he was graduated from college.

D. E. Blair

But this does not tell the whole story. In the course of his work he has had much to do with the development of modern electric railway rolling stock. One of his earliest accomplishments in this line was the pay-as-you-enter car, which was designed under his supervision soon after he accepted his present position. The ability of the man is recognized not only in Canada but in the United States as well, and his popularity is attested by his elevation to the presidency of the Canadian association. At the recent meeting it was remarked that Mr. Blair was one of the two men present who had been at the first meeting of the association when it was founded, in 1904.

A native of Canada, Mr. Blair received his preparatory schooling in the Quebec High School, after which he took a course in electrical engineering at McGill University, receiving the degree of B.Sc. from that institution at the age of eighteen.

Whatever problem Mr. Blair attacks he pushes to completion with vigor, a characteristic which extends even to his avocations. In summer he is an enthusiastic tennis player. Since the development of the radio he has spent much of his spare time in the winter in the construction of radio sets. He is an enthusiastic radio listener at times, but his real interest is in securing the highest degree of technical perfection in the construction of the sets which he has built. Nothing but the *ne plus ultra* satisfies the man when working either as a professional or an amateur. Perfection in things mechanical is of course impossible, but if it were possible Mr. Blair would achieve it. Nothing less would satisfy him.

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**R. H. Filbeck** was elected president of the Terre Haute Traction & Light Company, Terre Haute, Ind., at the recent annual meeting of the directors.

**W. A. Robertson** is now the new superintendent of the Jacksonville Traction Company, Jacksonville, Fla. He has been with Stone & Webster for about fifteen years. For the past several years Mr. Robertson has served as general superintendent of the Eastern Texas Electric Company, operating local and interurban lines in Beaumont and Port Arthur. He succeeds C. E. Bostwick, Jr., who, as noted in the ELECTRIC RAILWAY JOURNAL for June 14, has been made general manager of the White Stage Line Company, with headquarters at Tampa.

"Judge" and **Mrs. S. D. Hutchins** have just returned from a ten weeks' tour and vacation in Europe. Mr. Hutchins has been representative of the Westinghouse Traction Brake Company in the central territory for many years and is active in the affairs of the Central Electric Railway Association. For many years he has been chairman of the committee which arranges for the conventions of the association, and in that capacity is permitted carte blanche by the executive committee. The Judge was a little out of sorts physically when he went to Europe, and it is hoped that the errand of regaining his strength, on which his company sent him abroad, was accomplished 100 per cent.

**J. F. Rodgers** has resigned his connection as engineer with the department of way and structures of the Brooklyn City Railroad. Mr. Rodgers has long been engaged in electric railway work. Following the earthquake and fire in San Francisco he was assistant engineer in the rehabilitation of the property of the United Railways there. Before that he had been connected with the transportation department of that company. Subsequently he became connected with the Board of Supervising Engineers, Chicago Traction, as assistant engineer and later served with the Chicago Surface Lines as superintendent of track.

**W. R. Huffer** has been appointed traveling passenger and freight agent of the Indianapolis, Columbus & Eastern and the Columbus, Newark & Zanesville Railway. Mr. Huffer has been associated in the past with the Western Ohio Railway at Lima. His headquarters will be the public relations department, Columbus, Ohio.

## Travis H. Whitney in Brooklyn Post

### Former Public Service Commissioner Elected Vice-President of Brooklyn-Manhattan Transit Corporation

Travis H. Whitney on June 16 was elected vice-president of the Brooklyn-Manhattan Transit Corporation, which a year ago succeeded the Brooklyn Rapid Transit Company. The position is one that has been open since the company was organized. During the last five years Mr. Whitney has been engaged in private practice of law, but he has maintained a close interest in transit matters and since last year has been very deeply interested in railway affairs, particularly in Brooklyn as a public director of the company of which he now has been elected an officer.

Mr. Whitney was with the Public Service Commission for the First District of New York for twelve years. He was appointed secretary in 1907 by the original Hughes Commission and served for nine years, when he was appointed and served as a commissioner until 1919. He was particularly in charge of transit development and construction in New York City during the war period when the major part of the new elevated and subway lines were constructed or completed.

G. M. Dahl, chairman of the executive committee of the Brooklyn company, has stated that as a public director nominated by the Transit Commission Mr. Whitney's point of view has been very valuable and helpful in promoting a better understanding between the company and the public, a result of the greatest importance to both. It is Mr. Dahl's belief that as vice-president, Mr. Whitney, with his point of view based on public needs, will have a still greater opportunity to promote understanding and confidence between the public on the one hand and the company and its investors on the other.

There is sound substantiation for this expression of opinion. It is, indeed, a rare background of experience that Mr. Whitney brings to his new position. The original Hughes commission with which he served was one of the first regulatory bodies of the kind, and with all due respect to the successor members on that body the commission as originally constituted was particularly notable for the ability of the individual members and the extremes of thought which the men composing the commission represented. Precedents which that body set in its deliberations have been written into the regulatory law of the land, and as secretary of the commission Mr. Whitney's ideas were not without influence on the deliberations of the first New York commission.

Aside from the formal work of the commission, however, Mr. Whitney was by the very nature of his post, first as secretary to the commission and later as a member of that body, in a particularly advantageous position to judge the problems confronting the utilities and to grasp the point of view of a public ever seeking increased and greater public utility facilities. Moreover, while Mr. Whitney was in public office the panorama of local politics was ever before him. To very few persons, indeed, are opportunities presented similar to those which Mr. Whitney has enjoyed in his public posts.

Mr. Dahl himself has at the back of him experience in commission work and is particularly keen in his appreciation of the complexity of the problems presented in dealing with the public. Moreover, since his connection with the company Mr. Dahl has been the principal spokesman of the company with respect to major public relations matters. Mr. Dahl's announcement of Mr. Whitney's appointment has been interpreted to mean that in the future the bulk of this work will be carried on by Mr. Whitney.

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T. H. Whitney

Mr. Whitney was born at Gentryville, Ind., on June 22, 1875. He was graduated from the Harvard Law School, and began the practice of law in New York City immediately thereafter.

# Obituary

## H. M. Swetland, Noted Business Publisher, Dies

H. M. Swetland, president of the United Publishers Corporation, which publishes *Iron Age, Dry Goods Economist, Automotive Industries* and other important business publications, died at his home in Upper Montclair on June 15. He was one of the pioneers of modern industrial publishing and had been a leader in raising journalistic standards through his activities in the Associated Business Papers. At one time he was owner of *Power* and of *Engineering and Mining Journal* (as it was then called), both now owned by the McGraw-Hill Company.

Mr. Swetland was born in Chautauqua County, New York, in 1853. In 1880 he came to New York as reporter and as subscription and advertising salesman of the *Boston Journal of Commerce.* In 1884 he became Boston representative of *Power*, later coming to New York and assuming the management of that publication. In this capacity, he was associated with James H. McGraw, now president of the McGraw-Hill Company, and Emerson P. Harris. The association was discontinued in 1888 when Mr. Swetland purchased *Power*, the ownership of which he retained until he sold the paper to the late John A. Hill in 1900.

For many years thereafter, Mr. Swetland gave his chief attention to the publication of magazines serving the automotive industry. In 1911 he organized the United Publishers Corporation, which brought together publications in the steel, automotive, building and textile fields. He was elected president of that corporation and retained that office to the time of his death. He was also president of the National Publishers Association, the Class Journal Company, the Federal Printing Company, the U. P. C. Realty Company and the Swetland Realty Company, and a director of the Commercial Trust Company.

Mr. Swetland's work and contribution to industrial publishing are well set forth in the following tribute paid to him by his life-long friend and former associate, Mr. McGraw:

> Mr. Swetland's success as a man and a publisher was due to a rare combination of personal qualities and business acumen. He was a tireless worker, had great penetration, concentration, and perseverance. He was an organizer of the first rank, and was always a co-operator. His ideals in publishing were high, service to the readers of his publications being his first consideration. The publishing business has lost an outstanding figure in the passing of Horace M. Swetland, but his work will endure in the great institutions to which he gave unstinted devotion, and in the lives of those whom he trained in the technique of publishing and encouraged to make the best of their opportunities.

Mr. Swetland not alone won for himself marked distinction in American technical journalism and in those industries which his papers served, but —what he prized more—the high regard and respect of all his very wide circle of associates, business and social. To these, his passing brings a keen regret.

**Edward D. O'Brien**, assistant superintendent of public utilities at Seattle, Wash., since 1919, died there recently, at the age of fifty-one years. Mr. O'Brien had been in the service of the city since March 1, 1909. He was a graduate of the Armour Institute of Technology in electrical engineering. He was also a lawyer.

**Vincent J. Waltz**, claims attorney for the Community Traction Company, Toledo, died at his home there on June 1, following an illness of eight weeks. He had been identified with the Doherty properties in Toledo and particularly the traction lines for the last fifteen years in claims work. He was one of the organizers of the Toledo Safety Council and its first president until he was forced to resign because of ill health a few weeks ago. Mr. Waltz was born in Cuyahoga Falls, Ohio, forty-eight years ago. He was graduated from Ohio Northern University at Ada.

# Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

## Status of Copper Market

### Big Increase in Copper Production and in Domestic Consumption During 1923

Smelter production of primary copper from domestic sources increased approximately 51 per cent in 1923 over 1922, according to statistics of the Department of the Interior. At the same time there was an even greater increase in the value of smelter production, which was approximately 64 per cent greater than the preceding year, due to the high prices prevailing during the first quarter. Smelter output in 1923 was 1,434,999,962 lb. as against 950,285,947 lb. in 1922. The average price of copper delivered during the year was 14.71 cents per lb., an increase of about 1.2 cents per pound over the average figure for the year before. There was a very great increase in domestic production of new refined copper from both domestic and foreign sources, the rate being higher in 1923 than during any previous year except the abnormal years of 1916, 1917 and 1918.

Domestic consumption has kept pace with production and except for the years mentioned was also at the highest rate, but because of unfavorable conditions in Europe, which have retarded consumption in the important consuming countries there, and because of the increased production in South America and Africa, which has tended to increase competition in European and other markets, stocks have increased and prices are still below what the producers had confidently expected they would be at this time. The producers have offset the low selling price of copper, so far as they have been able, by decreased costs of production. These decreases have been obtained by increased efficiency of operation, by improved labor, by consolidation of mining companies, by closer co-operation between producers and manufacturers.

The stocks of refined new copper have increased from 216,000,000 lb. at the end of 1922 to 264,000,000 lb. at the end of 1923, and stocks of blister copper and materials in process of refining have increased from 361,000,000 lb. at the end of 1922 to 432,000,000 lb. at the end of 1923.

During the year the Calumet & Hecla, the Ahmeek, the Allouex, the Centennial and the Osceola companies formed the Calumet & Hecla Consolidated Copper Company and the Kennecott Copper Corporation absorbed the Utah Copper Company.

Some salient figures of the copper industry are given in the accompanying table.

| Year | Smelter Production (Domestic) | Refinery Production (Domestic and Foreign) | Imports (Unmanufactured) | Exports of Metallic Copper | Withdrawn on Domestic Account |
|---|---|---|---|---|---|
| 1913 | 1,224,484,098 | 1,615,000,000 | 409,000,000 | 926,000,000 | 812,000,000 |
| 1914 | 1,150,137,192 | 1,533,800,000 | 306,000,000 | 840,000,000 | 702,000,000 |
| 1915 | 1,388,009,527 | 1,634,200,000 | 316,000,000 | 682,000,000 | 1,137,000,000 |
| 1916 | 1,927,850,548 | 2,259,400,000 | 462,000,000 | 784,000,000 | 1,479,000,000 |
| 1917 | 1,886,120,721 | 2,422,000,000 | 556,000,000 | 1,126,000,000 | 1,395,000,000 |
| 1918 | 1,908,533,595 | 2,394,000.000 | 576,000,000 | 744,000,000 | 1,662,000,000 |
| 1919 | 1,286,419,329 | 1,770,000,000 | 429,000,000 | 516,000,000 | 914,000,000 |
| 1920 | 1,209,061,040 | 1,526,000,000 | 486,000,000 | 623,000,000 | 1,054,000,000 |
| 1921 | 505,586,098 | 951,000,000 | 350,000,000 | 628,000,000 | 611,000,000 |
| 1922 | 950,285,947 | 1,256,000,000 | 541,000,000 | 743,000,000 | 897,000,000 |
| 1923 | 1,434,999,962 | 1,980,000,000 | 676,000,000 | 829,000,000 | 1,300,000,000 |

## Startling Statistics of Material Consumption at Chicago

A statistically minded person would find much material for study in figures of the Chicago Surface Lines, prepared by the company's auditor, designed particularly to contrast conditions in 1914 with those that prevail now. Thus to the man in the street who hears an occasional squeal as a trolley car passes by it might appear that the company seldom did anything to ameliorate this condition. Company figures, however, show that it used 60,039 gal. of car oil in the year 1923, 38,597 lb. of gear grease and 15,026 gal. of compressor oil.

A flat wheel? The company turned 16,190 pairs of wheels in 1923 and 17,062 pair the year before, and at the same time renewed 7,824 wheels in 1923 and 6,600 the prior year.

A car not properly swept? The company wore out 16,731 brooms in one year and swept and disinfected 1,201,580 cars in the same period of time. The area of the glass in the company's cars is 1,476,525 sq.ft. or the equivalent of 34 acres.

The total heater capacity of the cars is 42,222,860 watts. The motors number 11,960 with a total horsepower of 505,710.

More than 1,625,000 trainmen's trip sheets were printed in 1923, enough to make a stack 677 ft. high, and a total of 1,822,094,000 transfers was printed, sufficient if placed end to end to extend for 145,586 miles.

Compared with this, the report of the Chicago Surface Lines reveals, there is $1.38 revenue received in 1924 compared with the dollar of a decade ago. Just as enlightening are the figures of the cost of track construction. Starting in 1914, with the mile costing $47,446 to the peak in 1920 when the same mile cost $107,232, the figure now stands at $93,785.

## Railway Market for Buses Growing Fast

At present writing, 155 electric railways are operating at least 2,000 buses. The realization that there is a real field for buses in the hands of the present electric railway companies, which now see themselves as "transportation companies," embracing all kinds of transportation vehicles in the service for which each is suited, is spreading rapidly.

On the basis of its records of bus purchases to date and its knowledge of the thinking of railway men, the ELECTRIC RAILWAY JOURNAL sees the future market for buses in the electric railway field about as shown in the following table, taking the average cost at $7,000:

BUS SALES TO ELECTRIC RAILWAYS

| | | |
|---|---|---|
| 1922 | 240* | $1,680,000 |
| 1923 | 621* | 4,347,000 |
| 1924 | 2,000 | 14,000,000 |
| 1925 | 7,000 | 49,000,000 |
| 1926 | 15,000 | 105,000,000 |

*Actual

## $75,000,000 Common Authorized by Westinghouse

The Westinghouse Electric & Manufacturing Company at its annual meeting on June 11 increased the authorized capital stock from $125,000,000 to $200,000,000. The additional stock will consist of common shares.

President E. M. Herr said business was quite satisfactory so far as the Westinghouse was concerned, "especially considering the tendency of business in general to slow up at the present time." Mr. Herr said that while the company's business also is somewhat less than for the corresponding period a year ago, the decrease has not been of sufficient volume materially to affect operations, and the company's commercial officers believe that it will improve in the fall—to what extent, of course, depending somewhat upon the result of the political campaign.

H. P. Davis, vice-president of Westinghouse Electric, and Loyall A. Osborne, president of the Westinghouse International Company, were elected directors to succeed W. H. Woodin and J. C. Bennett, retired. Mr. Bennett continues as secretary and controller of the Westinghouse Electric.

## Metal, Coal and Material Prices

| **Metals—New York** | June 17, 1924 |
|---|---|
| Copper, electrolytic, cents per lb. | 12.60 |
| Copper wire base, cents per lb. | 14.875 |
| Lead, cents per lb. | 6.925 |
| Zinc, cents per lb. | 6.17 |
| Tin, Straits, cents per lb. | 44.625 |
| **Bituminous Coal f.o.b. Mines** | |
| Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons | $4.325 |
| Somerset mine run, Boston, net tons | 2.175 |
| Pittsburgh mine run, Pittsburgh, net tons | 1.875 |
| Franklin, Ill., screenings, Chicago, net tons | 1.925 |
| Central, Ill., screenings, Chicago, net tons | 1.625 |
| Kansas screenings, Kansas City, net tons | 2.50 |
| **Materials** | |
| Rubber-covered wire, N. Y., No. 14, per 1,000 ft. | $6.25 |
| Weatherproof wire base, N.Y., cents per lb. | 17.25 |
| Cement, Chicago net prices, without bags | $2.20 |
| Linseed oil (5-bbl. lots), N.Y., per gal. | $0.97 |
| White lead, in oil (100-lb. keg), N. Y., cents per lb., carload lots | $11.75 |
| Turpentine (bbl. lots), N. Y., per gal. | $0.835 |

## *Rolling Stock*

**Third Avenue Railroad, New York, N. Y.,** has placed an order with J. G. Brill Company for fifty single-truck closed cars. Delivery will begin July 15 and will be completed by Sept. 1. These cars will have a length over all of 30 ft. 3½ in., a width of 8 ft. 2 in. and a truck wheel base of 8 ft. They will seat thirty-six people and weigh approximately 10 tons with all equipment. The car body is of all steel construction with headlining and is provided with arch roof. The equipment for these cars will be taken from some of the company's 500 type cars which are now in service and will include the McWhirter pedal control of the equipment and the air brakes.

**Jamestown Street Railway, Jamestown, N. Y.,** is planning the purchase of eight or ten improved one-man cars for its Jamestown-Falconer line.

**Lorain Street Railway, Lorain, Ohio,** has ordered five new city cars of the Peter Witt type for its city lines.

**Monongahela - West Penn Public Service Company, Fairmont, W. Va.,** expects on July 15 to receive the three cars ordered in April of this year. The specifications of these cars follow:

| | | |
|---|---|---|
| Builder of car body, | | Cincinnati Car Company |
| Type | | Single truck safety car |
| Seating capacity | | 28 |
| Weights | Car body | 8,000 lb. |
| | Truck | 6,500 lb. |
| | Equipment | 4,000 lb. |
| | Total weight | 18,500 lb. |
| Length over all | | 28 ft. 8 in. |
| Wheelbase | | 8 ft. 6 in. |
| Width over all | | 8 ft. 2 in. |
| Height, rail to trolley base | | 10 ft. 3¾ in. |
| Body | | Steel |
| Interior trim | | Cherry |
| Headlining | | Agasote |
| Roof | | Arch |
| Air brakes | | Westinghouse |
| Armature bearings | | Bronze |
| Axles | | Carnegie A.S.T.M. Spec. |
| Bumpers | | Cincinnati Car Company |
| Car signal system | | Consolidated |
| Car trimimngs | | Bronze oxidized |
| Conduits and junction boxes | | Duraduct |
| Control | | Westinghouse K-63 BR |
| Couplers | | Cincinnati |
| Curtain fixtures, | | Railway Supply & Curtain Company |
| Curtain material | | Pantasote |
| Destination signs | | Hunter illuminated |
| Door operating mechanism, | | National Pneumatic |
| Wheelguards | | H-B |
| Gears and pinions | | Nuttall helical |
| Hand brakes | | Cincinnati |
| Heater equipment | | Consolidated |
| Headlights | | Ohio Brass dash type |
| Journal boxes | | Symington |
| Lighting arresters | | Westinghouse K-3 |
| Motors | | Two Westinghouse No. 508-A, inside hung |
| Enamel | | Sherwin-Williams Old Dutch |
| Registers | | International R-10 |
| Sanders | | Ohio Brass |
| Sash fixtures | | Bronze oxidized |
| Seats | | Wood slat |
| Slack adjuster | | Gould automatic |
| Springs | | Cincinnati |
| Trolley retrievers | | Earle |
| Trolley base | | Simplex No. 3 |
| Trolley wheels | | More-Jones 6-in. No. 2 |
| Trucks | | Cincinnati 139-C |
| Ventilators | | Nichols-Lintern, type A |
| Wheels | | Steel, 26 in. diameter |
| Power-saving device, | | Economy 100-amp. meter |

**Eastern Massachusetts Street Railway, Boston, Mass.,** has purchased three California type buses with a capacity of twenty-two persons each.

**Olean, Bradford & Salamanca Railway, Olean, N. Y.,** recently placed an order for four new one-man safety cars, two for use in Olean city service and one each at Salamanca and Bradford. One car has already been delivered and has been put in service at Salamanca, according to announcement of District Superintendent A. C. Sloan.

**Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich.,** contemplates the purchase of several new cars of the one-man type to use on its interurban short lines.

**Pacific Electric Railway, Los Angeles, Cal.,** has placed an order for ten more double-deck buses with the Fageol Motors Company in addition to the order mentioned in the ELECTRIC RAILWAY JOURNAL, issue of May 3.

## *Track and Line*

**Tri-City Railway, Davenport, Iowa,** has started a $45,000 double-track improvement project. Construction will be a continuation of the new improvement work begun last year, carrying the improved right of way from the loop to Warren Street.

**Indianapolis Street Railway, Indianapolis, Ind.,** will spend $185,000 on track repair work. This amount is part of the $500,000 additional revenue estimated to accrue from the new fare.

**Seattle, Wash.**—Paving work between tracks in several districts of the city, involving a cost of more than $200,000, will be started at once, according to an announcement of the utilities committee of the City Council, following assurances from the Seattle Clearing House Association that warrants issued by the Seattle Municipal Railway Department will be accepted. Bills for the paving work will not fall due until next winter. Among the first jobs to be let will be the Fauntleroy Avenue and the Twenty-second Avenue, N. E., contracts, on both of which the street paving is now under way.

**Canadian National Railways, Toronto, Ont.,** which owns and operates the system at Niagara Falls, Ont., has started work on the rehabilitation of the system in that city. The company will spend about $350,000 in relaying the tracks and roadbeds. It is planned to have the work completed by Sept. 1. Early in 1925 the company intends to construct an entirely new line out Lundy's Lane.

## *Trade Notes*

**Truscon Steel Company, Youngstown, Ohio,** has announced the appointment of Frederick Maples as manager of the newly instituted steel pole department. He was for a number of years power director of the Long Island section of the Pennsylvania Railroad and was until recently connected with Hubbard & Company, Pittsburgh, manufacturers of pole line construction materials. This new steel pole, which the Truscon Steel Company is soon to put in quantity production, is the result of long experimentation and studied development. It is designed primarily to meet the pressing demand for a steel pole that would be strong, rigid, durable and economical in either light or heavy duty service. The construction of this pole is described elsewhere in this issue.

**General Electric Company, Schenectady, N. Y.,** has awarded a contract to the Turner Construction Company of New York for a six-story reinforced concrete building to be erected at West Philadelphia. This building, in connection with two one-story structures now nearing completion, will be the initial development of a plant to be devoted entirely to the manufacture of switchboard devices.

**Economy Fuse & Manufacturing Company, Chicago, Ill.,** announces the appointment of Morgan P. Ellis as general sales manager. Mr. Ellis has been assistant general sales manager for the past eight years.

**Max Riebenack, 3d,** is now permanently connected with the Philadelphia branch of the Industrial Works, Bay City, Mich., as district sales engineer, Mr. Riebenack was formerly mechanical and research engineer with the National Aniline Chemical Company and the Industrial Separators Company, Philadelphia.

**Trico Fuse Manufacturing Company, Milwaukee, Wis.,** has recently moved its New York office to larger and better quarters at 154 Nassau Street, R. F. Walsh, district manager in charge. The new office of the company in New York is more centrally located than was the old one, and the change makes it possible for the company to insure still better service for Trico powder-packed, time-limit renewable fuse users in the Greater New York district.

## *New Advertising Literature*

**Midwest Air Filters, Inc., New York, N. Y.,** has issued its new data book entitled "Air Filters for Compressors and Internal Combustion Engines."

**Southern Pine Association, New Orleans, La.,** has issued the ninth revised edition of its manual on standard wood construction.

**Wagner Electric Corporation, St. Louis, Mo.,** has published reprints of a paper read before the joint convention of the Southwestern Geographic Division of the National Electric Light Association entitled "Some Recent Comprehensive Tests on the Fynn-Weichsel Motor"; also a reprint from an article in *Iron and Steel Engineer* called "The Motor that Corrects Power Factor," and a third presented before the electric section of the Wisconsin Utilities Association called "Tests on the Fynn-Weichsel Motor."

**Refractories Manufacturers' Association, Pittsburgh, Pa.,** has issued the fifth edition of its "Book of Brands." In addition to a complete list of manufacturers of fire brick in this country and in Canada, the pamphlet gives an alphabetical list of the brands and trademarks used in the industry.

**Taylor-Wharton Iron & Steel Company, Highbridge, N. J.,** has issued a twenty-page pamphlet entitled "Putting the Right Steel on the Job." The pamphlet is issued primarily to emphasize the lasting quality of Tisco steels.

New York, June 28, 1924

# Electric Railway Journal

*Consolidation of Street Railway Journal and Electric Railway Review*

Published by McGraw-Hill Company, Inc.

HENRY W. BLAKE and HARRY L. BROWN, *Editors*

*Volume 63*
*Number 26*

## Basic Soundness of the Industry Shown Again

IN RECENT years there has been a tendency among investment bankers to make a wry face whenever electric railway securities were mentioned. This attitude has gone so far that in a number of cases the name of a company operating electric railways has been changed to disguise that fact, and to give added emphasis to the light and power end of the business. It would seem that there is an idea in some quarters that the electric railway is on the way to join the dodo, the mastodon, and other extinct species.

That there is no real foundation for this attitude is shown conclusively by statistics gathered from a large share of the leading electric railways in this country, as presented in this issue in an article by John F. Layng. Although other forms of transportation have come into more or less prominence within the past few years, the basic soundness of the electric railway industry is shown by the steady increase in riding over a considerable period of years. Even though there have been fare increases and transportation difficulties, the demand for such transportation continues to grow. And with increasing congestion on the business streets of all cities, it is likely to climb still faster.

As a result of the improvements and economies being effected by the comprehensive modernization program now getting started in the industry, Mr. Layng points out that there is no reason why the securities of this six-billion-dollar industry should not again be in favor with the investor. Supplying a basic need for transportation, without which our modern large cities could not exist, it is absolutely certain that this will be the case. It is to be hoped, for the good of all concerned, that the recovery will come with all speed. And it is believed it will, for the realization of the basic soundness of the industry is at last taking hold rapidly among bankers and investors and the men of our own industry and the public generally.

## Who Is to Blame if the Public Has a Wrong Idea About Railways?

THIS question was asked by a speaker at the meeting of the New York Electric Railway Association on June 21, and then answered by the same man with the assertion that the railway men themselves are at fault if the public has the wrong idea. The speaker said he was of two minds whenever he began to think about electric railways. As a representative of an industry closely allied with the railways, he was sympathetic toward their problems and wished to see them fairly treated. As a plain, every-day citizen who rides in the street cars, he said he was "sore" at the quality of service, the rates of fare, and the incivility of many of the employees, and he did not care whether the companies got a square deal or not. This, the speaker claimed, is the attitude of a large part of the public and is a condition for which the managements are to blame.

At first thought this may seem to be a rather harsh accusation. But if one considers it carefully, one begins to wonder if it isn't pretty nearly right after all. The speaker made no pretense that the attitude of the average citizen is just or reasonable. He himself does not blame the management for all the shortcomings of the service, because as a fellow worker in the field of public utilities, he knows the reason for many of these things and that the companies are not to be blamed. But the general public often blames the railway because the public has not been told, frankly and fully, the railway story.

It must be admitted that there is a good deal of truth in this argument. We all know railways that are working hard day and night under adverse conditions to give the best possible service—and saying nothing about it. That actions speak louder than words is perhaps their motto. So much of this activity, however, is necessarily hidden from the public gaze, that the average man has no conception of what the company is really doing to provide him with transportation. The actions are fine—but why not help them out with words—the right kind of words?

"We can't afford to advertise," the management may say. If the public in a particular locality has the wrong idea about the railway, the management cannot afford not to advertise. This is not a new thought. It merely is to emphasize that many railways have not yet gotten the point.

## Another Impetus to Modernization

PRESIDENT BUDD of the American Electric Railway Association has conceived another plan for giving modernization in the industry a further impetus, and the executive committee at its last meeting gave its approval. He has appointed a committee on foreign operation to team up with the committee on city operation and the committee on interurban operation in bringing out before the industry any practices of any company which represent an advance in the art and which will help to point the way toward raising electric railway service generally up to the level it ought to have as of 1924. The committees on city and interurban operation have searched out the advance practices in this country. The committee on foreign operation will leave shortly for a trip to Great Britain, France and other countries, to search out any practices of the foreign companies which seem to the committee, in the light of its broad knowledge of operation here, to be an advance over our practices.

The new committee is to consist of James W. Welsh, executive secretary American Electric Railway Association; Harley A. Johnson, Chicago Rapid Transit Company and Chicago, North Shore & Milwaukee Railroad and president American Electric Railway Engineering Association, and Harry L. Brown, editor ELECTRIC RAILWAY JOURNAL. The association will pay the way of only Mr. Welsh. Mr. Budd said if the association would pay the way of one man, he would pay the way of one and would ask Mr. McGraw to pay the way of an editor of the JOURNAL. While the earnings of the JOURNAL hardly warrant such an extra expenditure this year, Mr. McGraw's quick response to Mr. Budd's suggestion was typical of him whenever there is an opportunity to do a service to the industry. He said, "Yes, we'll send a man, Mr. President—we'll send him if the JOURNAL has to borrow the money."

The committee, as Mr. Budd suggested to the executive committee, will report back its findings and get them out to the field just as rapidly as possible through the JOURNAL and at the October convention. The Europeans have been doing some things from which it appears that American transportation men can learn better ways. But the first hand impression of these things by men versed in American practice is needed in order to give them an intelligent interpretation for study here. Needless to say, Mr. Budd's latest suggestion should be of great value in rounding out the program of modernization which is to be the main theme of this year's convention and of the Annual Convention Number of this paper.

## Paving Charges Translated Directly Into the Rate of Fare

"A NICKEL must come in for every nickel that goes out." This statement, quoted from the decision of the Transit Commission of the State of New York in the case of the New York & Queens County Railroad, printed elsewhere in this issue, marks a new and commendable departure in fare regulation. The decision was written by Commissioner Harkness and it is an outstanding document because of the simplicity, clarity and forcefulness of the analysis presented of this street railway's situation and its reciprocal obligations with the public. It is a fine example of the constructive work that can be done by a commission when it rises above political opposition.

In its decision the commission recognized the basic fact that, regardless of politics and politicians, the public cannot continue indefinitely to get something for nothing. The road, already in receivership, was recently ordered by the Federal court to cease operation unless an increase in fare sufficient to cover operating expenses were granted. Thus a prompt decision of the regulatory body was forced. It is the first definite break from the basic 5-cent fare in the New York City district to be ordered by the Transit Commission.

The order of the commission provides that the basic fare shall be increased from 5 cents to 6 cents to take care of ordinary operating costs, which are not met at the present rate. But the unique feature of the order is that, if the city of New York persists in requiring the company to pay for paving estimated to cost $309,000 this year, the fare is to be increased on a sliding scale of 1 cent additional for each $100,000 assessed on the railway for this purpose.

This new way in which the commission has provided for paving charges should put the matter in a different light. The car rider now can see just what the imposition of this burden means to him. For instance, if the city insists on its original $300,000 paving program, the fare will be 9 cents instead of 6 cents. And since the decision holds that the excess over 6 cents must be applied specifically to the paving fund, there is no way in which the issue may be dodged.

Assuming that the decision holds, it is the duty of the receiver to let the car riding public know the full facts. In the language of the commission, "The imposition of such a paving charge against an impoverished railroad such as this and against its passengers is unreasonable. It is not a sufficient answer that it is required or sanctioned by law. Passing a statute does not of itself make its requirement reasonable, and when it results in situations such as this it properly should be amended."

It is to be hoped that the desired results will be secured. The court has still to accept the proposition, and it remains to be seen whether the revenue will be adequate to pay operating expenses.

## Keeping Pace with Changes in the Art

ONE can hardly realize the tremendous strides which have been made in the development of electric railway equipment without comparing the apparatus of the present-day with that in the early part of the electrical era. A particularly valuable contribution on this subject was made in a paper read before the New York Electric Railway Association by E. P. Waller, which appears in this issue.

In addition to its historical aspect, Mr. Waller's paper is most instructive on the subject of valuation of electric railways. The money spent, and necessarily spent, in the development of modern equipment through the purchase of early types is not now represented by any physical property, and the changes came so rapidly at the beginning it would have been difficult to have retired much of this superseded equipment through a depreciation reserve, even if the principles of depreciation had been understood as thoroughly in those early days as at present. Certainly the advance would not have been anywhere near so rapid if each type of equipment had had to earn enough over operating expenses and profit to retire itself. The fact is that in the cases of most roads no attempt was made to follow a plan of this kind. It was not considered by the companies necessary, because they believed that with the growth of population in the cities served by their lines, the values of their franchises were also appreciating to an extent more than sufficient to counterbalance even a rapid rate of depreciation on the equipment used.

Still another question is suggested by Mr. Waller's paper. To what extent can the industry now finance purchases of modern equipment to keep pace with improvements in the art, when there is such a small margin of surplus, and commissions and courts demand a closer relation between the physical valuation of a property and the rate of fare it is permitted to charge.

The answer is that the changes cannot be made so rapidly. Fortunately it is not now apparently necessary, if electricity is to remain the main motive power. In fact, the early times were too hectic for comfort. With a fairly liberal system of depreciation reserve, all ordinary needs can be cared for, and under special conditions requiring considerable changes, the public service commission would probably permit the establishment of the necessary reserve.

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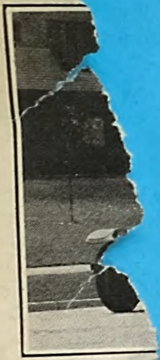

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or when a tire becomes badly worn. However, the operating company does give an accurate mileage record of each bus to the tire company. It is from these records that the tire bill is calculated, figured at a flat rate per mile of use. The tire company reserves the right to furnish either 34-in. x 5-in. or 36-in. x 6-in. tires. During the winter months the operating company requires 34-in. x 5-in. tires on the rear in order that the tire chains may be attached to the duals without removing the wheels. The tires are mounted on Budd-Michelin wheels.

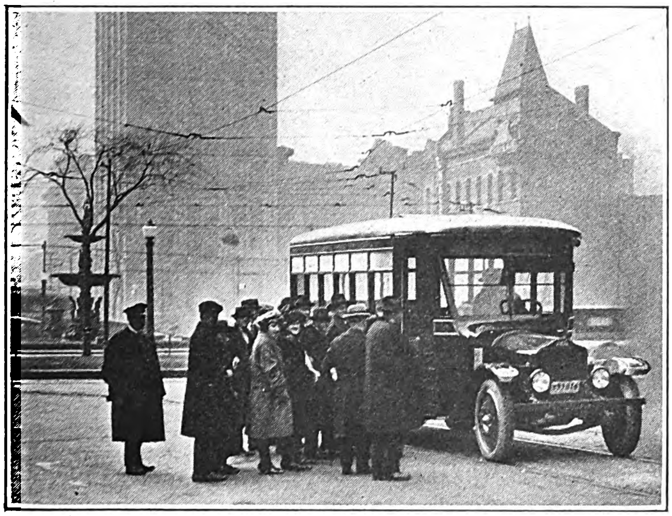
The wages of the drivers vary from 53 cents to 62 cents per hour. There is no base pay, the driver working between nine hours and ten hours per day and being paid for the time he works. Starting at 53 cents, the driver is advanced to 56 cents per hour at the end of three months, while at the end of one year he is given the maximum pay of 62 cents per hour. This maximum rate is the same as that paid to one-man car operators.

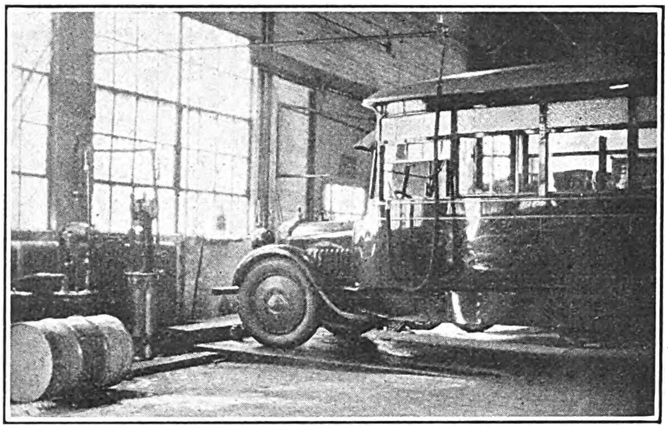
The average gasoline consumption of a bus is 0.2 gal. per mile. The oil consumption varies with the condition of the engine. The company maintains an adequate supply of fuel and oil on hand, making purchases of these at wholesale prices. Depreciation is figured at the rate of 25 per cent, but it is felt that with the high degree of maintenance this figure is very conservative.

### GARAGE DESCRIPTION AND PRACTICE

A rented garage is used as a base for the bus operation. It is located within three blocks of the central square, and is accessible from two streets and an alley. The building is approximately 200 ft. long and 150 ft. deep and has space for all of the 41 buses within this area and the two adjoining store fronts. As all of the floor space is not used during the day, storage facilities are offered to drivers of passenger cars desiring a parking space. This furnishes some revenue which goes to reimburse the garage department for the rental of the building. For this space the company receives an average of $300 per month.

All work connected with the maintenance of the buses is done at this garage, such as supplying oil, gas and water, washing and filling the tires. Each bus is given this attention every day, the majority of the buses being taken care of at night. The nightly "servicing" of the 31 vehicles must be performed with speed as it is necessary to go over 15 buses every morning between 1:30 and 2:30 a.m. As there are ten extra vehicles, work on these is done during the day. Each bus is inspected every five days, at which time minor repairs or replacement of worn units are made.


**Buses Formerly Were Loaded While on the Car Track, but Now All Buses Pull Up to the Curb for Loading and Unloading of Passengers**


**Placing the Front Wheels of the Bus on an Incline Levels the Chassis and Makes Possible an Accurate Determination of the Quantity of Oil in the Crankcase**

An interesting method of selecting the buses for inspection is followed. One day Nos. 1, 11, 21, 31, 41, 6, 16, 26 and 36 are put through the inspection shop. On the next day the 2's and 7's are inspected, the third day the 3's and 8's, etc. This method results in the entire fleet being inspected in five days.

The garage maintenance force consists of 25 men and is divided into a day and a night gang, each in charge of a foreman. During the day, five inspectors, one motor builder, one road man, one general repair man, two brakemen, three washers, one office boy, one janitor and one foreman are on duty. The night gang consists of a foreman, three brake men, two gas men and three washers. To facilitate the work of "servicing," there is a gasoline supply rack at the rear of the garage. This is an incline 6 in. high, at the top of which is a concrete bumper to stop the front wheels of the bus. On each side of the rack is a Wayne gasoline measuring pump with an overhead swivel feed pipe having the usual supply hose attached at its end. It is possible to fill the fuel tanks on a bus from either side. All of the buses have tanks on both sides, which has resulted from the company adding a 20-gal. tank connected with the main 30-gal. tank by a 1-in. diameter brass pipe. While it is possible to fill from one side, it expedites the work to pump into both tanks. The storage tank of 2,000 gal. capacity is located in the ground at the rear of the building.

By driving the bus up the incline, the chassis is made level so that the quantity of oil in the crankcase may be accurately determined and the proper amount added. While the oil and fuel are being added, the radiator is filled with water and the six pneumatic tires brought up to the proper pressure of 100 lb. per square inch. After this work is finished, the buses are moved over to the wash rack, where three washers clean them outside and inside. Supplying the gasoline takes about as long as washing, so that the buses move along quite rapidly. From the wash rack the machine is parked or berthed for the night, in which location it is greased. For this work a "Dot" 30-lb. capacity electrically driven grease pump is used. This is automatically controlled and supplies grease to the chassis bearings at a pres-

DISTRIBUTION OF EQUIPMENT AND SCHEDULE FOR BUS OPERATION

Total length of bus routes.................................. 16.7 miles

| Run | Number Base Schedule | Round Trip, Miles | Headway Normal | Headway Peak |
|---|---|---|---|---|
| Ford | 2 | 4.4 | 15 | 10 |
| Elm | 3 | 4.7 | 10 | 6 |
| Oak<br>Lincoln | 5 | 7.5 | 11 | 8 |
| South | 4 | 6.3 | 12 | 9 |
| Indianola | 3 | 6.6 | 12 | 10 |
| Hillman | 4 | 3.9 | 8 | 4 |
| Totals | 21 | 33.4 | | |

sure of 1,500 lb. per square inch. The use of this machine speeded up the lubrication to such an extent that it was possible to do away with the services of one man.

The quantity of oil added every night varies with the condition of the engine and may amount to 4 qt. or half of the proper amount to carry in the crankcase. Operating 225 miles per day, 4 qt. would mean a mileage of only 56 per quart. When this drops to 50, the engine is replaced by one that has been rebored or reconditioned with new piston rings. While it may happen that as much as one-half the quantity of oil in the crankcase is replaced each day, a complete change is made on inspection days (every fifth day) in order to remove the sediment from the crankcase.

Replacement of worn units is made whenever inspection discloses weak parts. The inspection every five days is complete, every detail of the chassis and body being subject to close scrutiny before it is marked up as O. K. by the inspector responsible for that portion of the work. This is divided into five sections, namely, motor, clutch, transmission, rear axle, brakes, electrical system and miscellaneous details. The details of inspection under each group are as follows:

**Brakes**

Adjust or reline foot brake.
See that all joints are free.
Remove rear wheels.
Adjust internal brake.
Adjust or reline external brake.
Oil all brake rods and pins.
See that both ratchets hold.
Oil hand brake ratchets.
Try brakes on floor.

**Clutch Transmission, Rear Axle**

Remove floor boards.
Wash out clutch.
Adjust clutch and pedal.
Oil pedals.
Oil throttle cross shaft.
Oil transmission.
Examine gear shift lever and reverse latch.
Examine all universal joints.
Oil rear axle.
Examine axle housing bolts.
Examine radius rods.
On Republic bus—grease wheel gears.

**Motor**

Try compression.
Clean spark plugs (set gaps 0.025 in.).
Adjust valve tappets (set 0.010 in.).
Examine for oil and water leaks.
Tighten or repack water pump.
Tighten fan belt.
Oil fan bearing.
Clean carburetor screen.
Clean vacuum.
Examine flexible tubes for leaks.
Examine radiator for leaks.
Oil gas and spark control pins.
Change oil in motor.
Tighten cylinder head nuts.
Examine radiator hose.
Adjust oil pressure regulator (gage should show 10 to 25).

**Electrical System**

Fill battery with water.
Scrape battery posts and terminals.
Examine cables for shorts.
Examine all connections.
Oil generator.
Clean commutator and brakes.
See that brushes slide freely in holder.
See that brushes are not worn short.
Clean and adjust magneto points.
Oil magneto.
Examine spark plug wire.
Examine ignition switch.
See that all lights burn.
See that lamps and lamp brackets and lenses are in good condition.
Test buzzers.
Test horn.
Inspect windshield cleaners.

**Miscellaneous**

Examine and oil both doors.
Examine seat brackets and cushions.
Replace any broken or cracked glass.
Examine front and rear bumpers.
Examine all fenders.
Tighten all wheel nuts.
Examine front wheel alignment.
Jack up front end and examine wheel bearings.
Examine both front and rear springs.
Tighten spring clip nuts.
Fire extinguishers.
Examine heaters.

A man is assigned to a bus and made responsible for the details included in one of these groups. After completing the inspection, the man puts his initials on the inspection sheet, which has a list of the cars for inspection that day. No bus leaves the garage until all of the work pertaining to it has been initialed. With a reserve of ten vehicles it is possible to meet emergencies by replacing a disabled bus and starting work on the disabled vehicle immediately after it enters the garage.

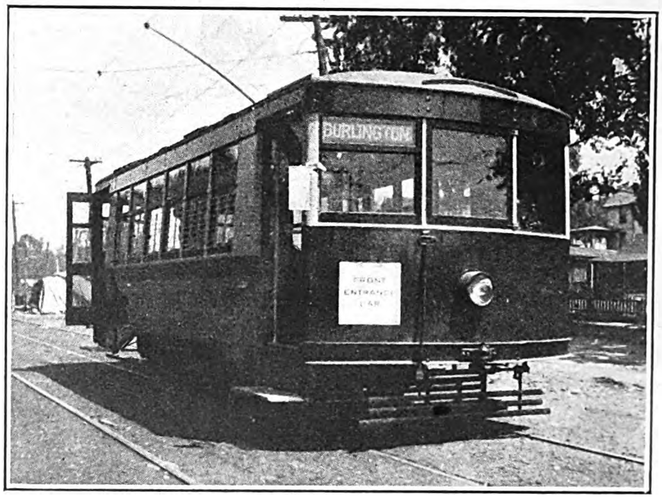
### FARE COLLECTION BY MEANS OF CLEVELAND FARE BOX

A cash fare of 8 cents and a ticket fare of seven for 50 cents is collected, as the passenger leaves, in a Cleveland fare box which is mounted on a stanchion at the right-hand side of the driver's position. This stanchion serves as a support for the door-operating handle and also supports a small money change tray into which the operator deposits the passenger's change. Transfers are issued between the buses and between the buses and street cars, for which privilege a charge of 1 cent is made. As the collection is made in a locked fare box, the conductor makes no account for the fares collected, he being held responsible only for allowing the passenger to drop his own fare in the box.

On the driver's daily report sheet, notations are made of street conditions, which are reported to the city with a request that repairs be made when needed. The daily report calls attention also to illegal parking of pleasure cars within bus-loading zones and serves as a basis for complaint to the city's police force.

## Changeable Indicator for Front-Entrance Car

FRONT-ENTRANCE, rear-exit, one-man safety cars have recently been purchased by the Knoxville Power & Light Company, Knoxville, Tenn. In order that the riders, who are accustomed to rear-entrance cars, might recognize the new vehicle more readily and be prepared to enter by the front doorway, a white sign reading "Front-Entrance Car" has been painted on the dash. However, since it may not be desired to operate these cars always as front-entrance cars, each is equipped with a flat piece of sheet iron, painted the same color as the dash, which may be hung over the white sign, concealing it completely. These plain yellow signs are stored in the carhouse when not in use.



The Front-Entrance Sign Can Be Concealed by Superimposing a Piece of Sheet Iron Painted the Same as the Dash

# Survey Shows Street Railways Sound

**Statistics Collected from 48 Large Systems Show that Passenger Traffic on Street Railways Is Still Increasing in Spite of Tremendous Growth of Other Transportation and that the Street Car Will Continue to Be the Vehicle of Mass Transportation**

*By John F. Layng*
Vice-President Buchanan & Layng Corporation, New York City

MANY times during the past few years predictions have been made that the street railways will be supplanted by other forms of transportation. The gigantic growth of the automobile and the bus have been so apparent to the general public that the situation with respect to the street railway has been lost sight of. Some time ago the writer decided to determine the actual situation with regard to the comparative amounts of traffic carried on urban street car systems now as compared with the past.

Figures collected for the years 1910, 1920 and 1923 from individual companies handling the street railway business in 48 of the largest urban centers of the United States, which include over half the urban population of the country and 28 per cent of the entire population of the United States, show a healthy condition of affairs in the electric railway industry that perhaps is not fully appreciated by those who are looking forward to the rapid decline of the street railway.

These figures, which are presented in the accompanying tables and charts, cover nearly all the cities of more than 100,000 population. The information was in general furnished by officials of the companies and may be regarded as authentic in all cases. Statistics for the New York subway and elevated lines, and also for the Chicago elevated lines, were not included, since it was considered less confusing to confine the survey so far as possible to surface cars.

The detailed results of the survey are given in Table I, which shows by individual cities the population, passengers and car-miles and from which were calculated the rides per capita and the rides per revenue car-mile. A condensed summary of the information for the United States is given in Table II.

### RIDERS ARE INCREASING STEADILY

Reference to Tables I and II shows that there has been a growth in revenue riders from 1910 to 1923 in all of the cities included. This has taken place despite the enormous growth in other forms of transportation, coupled with fare raises in nearly all of the cities. Revenue riders only were considered, since the transfer regulations differ widely throughout the cities studied, and the results might be misleading.

Increases in revenue rides per capita were shown for 60 per cent of the individual companies from 1910 to 1923, although there was a slight decline in revenue rides per capita for the grand total from 1920 to 1923. This is due in part to the development of other forms of transportation, and also to the rapid growth in population in the larger cities, coupled with a sharp recession in business activity, the employment at present not having got back to the boom conditions of 1920.

In order to carry this rapidly increasing army of riders, the companies have been obliged to give more intensive service. This is shown by the revenue car-miles, which have increased 19 per cent in the 14-year period, while the passengers have increased 53 per cent. This is shown graphically in Fig. 1.

The figures collected are in general similar to, although in considerably more detail than, those made public by the United States Census Bureau, which are given in Table III and charted in Fig. 3.

Coincident with this increase in street car riding, there has been an increase in the registration of motor vehicles that is unparalleled in modern history. From a registration of 468,500 vehicles in 1910, the registration figure has gone up to 15,092,000 in 1923. The data are given in Table IV, and are shown graphically in Fig. 2.

Even with this enormous growth in the number of motor vehicles, from the standpoint of passengers carried the year 1923 was the greatest in the history of the electric railway industry. These figures certainly show that the majority of the companies are gaining basic ground, especially as the rides per capita increased in so many of the cities.

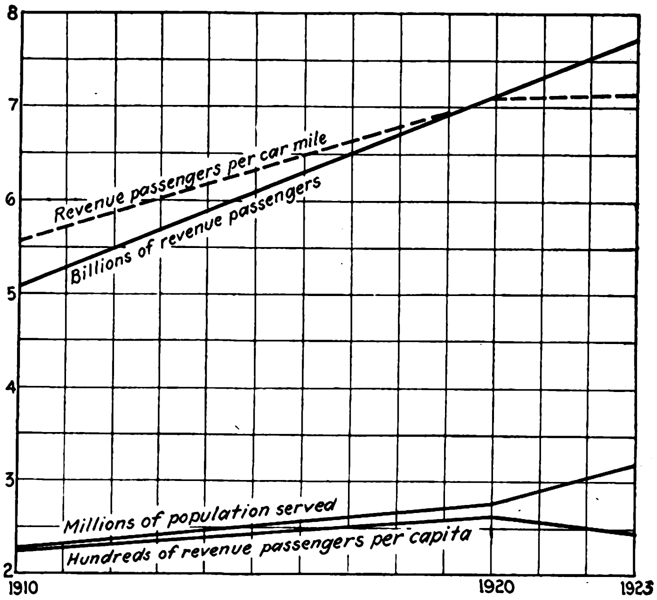


**Fig. 1—Fourteen-Year Record of the Trend of Population and Riding on Street Cars, Comprising Approximately 60 per Cent of the Industry**

This condition indicates that the automobile and the bus are not competing with the electric railways so much as that they are giving a service not rendered before their introduction into the transportation field. The novelty causes temporarily an abnormal use of any new facility. This increased use is caused by curiosity and hope (not based on experience or cost) that the new facility will better meet the needs of a community.

The effort and initiative of many persons in this country have contributed to the development of the automotive industry. When it was realized what it was possible for this transportation tool to accomplish for

# Table I—Traffic Statistics of Street Railways—Cities of the United States

| Year | Population | Revenue Passengers | Revenue Car-Miles | Revenue per Capita | Passengers per Car-Mile |
|---|---|---|---|---|---|
| **New York** (Surface traffic only) | | | | | |
| 1910... | 4,785,190 | 763,140,739 | 132,079,737 | 159.5 | 5.77 |
| 1920... | 5,663,980 | 941,420,788 | 111,538,195 | 167.0 | 8.43 |
| 1923... | 5,927,617 | 1,071,736,844 | 106,894,141 | 181.0 | 10.03 |
| **Chicago** (Surface traffic only) | | | | | |
| 1910... | 2,185,283 | 491,088,563 | 93,152,655 | 225.0 | 5.28 |
| 1920... | 2,701,212 | 769,025,413 | 117,436,051 | 284.0 | 6.55 |
| 1923... | 2,886,121 | 824,850,103 | 122,088,043 | 286.0 | 6.75 |
| **Philadelphia** (Surface and subway) | | | | | |
| 1910... | 1,549,008 | 375,922,814 | 72,899,072 | 242.0 | 5.15 |
| 1920... | 1,823,779 | 754,402,512 | 82,978,302 | 414.0 | 9.11 |
| 1923... | 1,922,788 | 732,162,843 | 87,694,521 | 381.0 | 8.36 |
| **Newark, Jersey City, Camden** (Public Service Railway) | | | | | |
| 1910... | 1,742,807 | 263,252,577 | 43,334,492 | 151.0 | 6.08 |
| 1920... | 2,400,028 | 361,691,558 | 59,992,805 | 150.5 | 6.04 |
| 1923... | 2,500,000 | 299,036,855 | 48,660,540 | 119.5 | 6.15 |
| (Strike, Aug. 1 to Sept. 20, 1923) | | | | | |
| **Detroit** | | | | | |
| 1910... | 474,697 | 141,690,525 | 25,828,703 | 298.0 | 5.48 |
| 1920... | 1,094,148 | ............ | .......... | .... | .... |
| 1923... | 1,128,268 | 357,386,437 | 49,334,286 | 317.0 | 7.25 |
| **Cleveland** | | | | | |
| 1910... | 590,000 | 171,753,896 | 25,844,634 | 291.0 | 6.64 |
| 1920... | 900,000 | 328,657,847 | 38,774,682 | 365.0 | 8.48 |
| 1923... | 1,000,000 | 300,996,272 | 36,018,693 | 300.0 | 8.34 |
| **St. Louis** | | | | | |
| 1910... | 769,000 | 230,691,532 | 40,625,757 | 300.0 | 5.68 |
| 1920... | 873,000 | 287,405,837 | 45,352,030 | 329.0 | 6.34 |
| 1923... | 900,000 | 292,671,781 | 45,716,369 | 325.0 | 6.40 |
| **Boston** (Surface and subway) | | | | | |
| 1910... | 1,030,044 | 298,507,787 | 53,925,578 | 290.0 | 5.54 |
| 1920... | 1,173,820 | 335,526,561 | 51,359,855 | 286.0 | 6.54 |
| 1923. . | 1,195,552 | 382,149,697 | 54,156,064 | 320.0 | 7.06 |
| **Baltimore** | | | | | |
| 1910... | 558,485 | 154,928,785 | 27,911,573 | 277.0 | 5.54 |
| 1920... | 733,826 | 253,934,199 | 37,162,202 | 346.0 | 6.83 |
| 1923... | 773,580 | 238,658,380 | 35,873,841 | 308.0 | 6.66 |
| **Pittsburgh** | | | | | |
| 1910... | 993,000 | 208,609,509 | 36,916,147 | 210.0 | 5.65 |
| 1920... | 1,165,000 | 277,214,889 | 37,295,727 | 238.0 | 7.44 |
| 1923... | 1,215,000 | 279,478,055 | 39,194,865 | 230.0 | 7.14 |
| **Los Angeles** | | | | | |
| 1910... | 319,198 | 86,851,011 | 24,120,853 | 272.0 | 3.60 |
| 1920... | 673,000 | 179,227,041 | 29,980,055 | 266.0 | 5.98 |
| 1923... | 1,085,000 | 247,607,235 | 31,813,926 | 228.0 | 7.78 |
| **Buffalo** | | | | | |
| 1910... | 423,715 | 91,437,164 | 17,235,026 | 217.0 | 5.32 |
| 1920... | 506,775 | 143,044,078 | 17,683,347 | 282.0 | 8.10 |
| 1923... | 550,000 | 116,958,344 | 17,045,139 | 212.0 | 6.76 |
| **San Francisco** | | | | | |
| 1910... | 416,912 | 146,822,685 | 20,296,698 | 352.0 | 7.24 |
| 1920... | 508,410 | 234,799,395 | 32,076,935 | 462.0 | 7.32 |
| 1923... | 687,000 | 245,525,371 | 31,926,048 | 357.0 | 7.68 |
| **Milwaukee** | | | | | |
| 1910... | 380,000 | 88,073,337 | 13,812,813 | 232.0 | 6.38 |
| 1920... | 460,000 | 132,189,830 | 19,183,522 | 287.0 | 6.89 |
| 1923... | 500,000 | 130,619,695 | 18,969,554 | 261.0 | 6.89 |
| **Washington** | | | | | |
| 1910... | 331,069 | 103,147,351 | 16,930,836 | 311.0 | 6.10 |
| 1920... | 437,571 | 154,731,613 | 20,619,681 | 354.0 | 7.50 |
| 1923... | 448,619 | 142,097,231 | 20,574,254 | 317.0 | 6.92 |
| **Cincinnati** | | | | | |
| 1910... | 430,000 | 102,033,956 | 22,007,627 | 237.0 | 4.64 |
| 1920... | 445,000 | 118,618,862 | 21,257,165 | 267.0 | 5.54 |
| 1923... | 454,000 | 108,625,599 | 18,643,562 | 239.0 | 5.83 |
| **New Orleans** | | | | | |
| 1910... | 329,750 | 80,408,085 | 19,021,429 | 244.0 | 4.23 |
| 1920... | 376,500 | 109,927,440 | 18,756,164 | 292.0 | 5.85 |
| 1923... | 391,000 | 107,471,356 | 15,657,379 | 275.0 | 6.85 |
| **Minneapolis and St. Paul** | | | | | |
| 1910... | 518,279 | 140,050,007 | 22,054,680 | 271.0 | 6.37 |
| 1920... | 620,386 | 227,653,559 | 27,986,273 | 365.0 | 8.14 |
| 1923... | 651,000 | 212,573,063 | 28,525,086 | 326.0 | 7.45 |
| **Kansas City** | | | | | |
| 1910... | 350,000 | 115,820,378 | 23,010,665 | 332.0 | 5.02 |
| 1920... | 455,000 | 124,350,397 | 24,308,911 | 273.0 | 5.10 |
| 1923... | 475,000 | 132,862,353 | 24,952,740 | 279.0 | 5.32 |
| **Seattle** | | | | | |
| 1910... | 237,194 | 72,900,989 | 12,963,331 | 307.0 | 5.12 |
| 1920... | 402,666 | 96,628,924 | 15,839,134 | 240.0 | 6.10 |
| 1923... | 349,525 | 78,181,048 | 16,094,373 | 213.0 | 4.86 |
| **Indianapolis** | | | | | |
| 1910 .. | 233,650 | 63,352,688 | 9,346,183 | 271.0 | 6.78 |
| 1920... | 314,194 | 96,023,629 | 12,490,988 | 306.0 | 7.70 |
| 1923... | 342,000 | 91,864,543 | 13,485,793 | 268.0 | 6.80 |
| **Rochester, N. Y.** | | | | | |
| 1910... | 225,000 | 54,721,030 | 9,562,815 | 243.0 | 5.72 |
| 1920... | 303,000 | 76,560,296 | 8,340,164 | 252.0 | 9.18 |
| 1923... | 325,000 | 73,477,537 | 9,375,416 | 226.0 | 7.85 |
| **Portland, Ore.** | | | | | |
| 1910... | 207,214 | 53,129,768 | 9,238,538 | 256.0 | 5.76 |
| 1920... | 258,288 | 71,175,872 | 15,012,542 | 275.0 | 4.73 |
| 1923... | 325,000 | 64,541,298 | 14,444,168 | 198.0 | 4.47 |
| **Toledo** | | | | | |
| 1910... | ........ | ............ | .......... | ..... | .... |
| 1920... | 285,000 | 55,614,971 | 8,260,421 | 195.0 | 6.74 |
| 1923... | 285,000 | 51,522,008 | 7,730,727 | 181.0 | 6.66 |
| **Providence** (Including Pawtucket, Woonsocket, Cranston) | | | | | |
| 1910... | 335,180 | 85,093,052 | 13,159,214 | 254.0 | 6.47 |
| 1920... | 374,746 | 127,482,086 | 14,138,691 | 340.0 | 9.00 |
| 1923... | 374,746 | 138,578,286 | 16,783,773 | 370.0 | 8.25 |
| **Columbus** | | | | | |
| 1910... | 188,000 | 50,987,073 | 7,759,351 | 271.0 | 6.53 |
| 1920... | 237,000 | 75,112,652 | 8,747,000 | 317.0 | 8.58 |
| 1923... | 250,000 | 70,177,236 | 9,377,377 | 281.0 | 7.50 |
| **Louisville** | | | | | |
| 1910... | 250,000 | 57,136,764 | 11,307,202 | 228.0 | 5.05 |
| 1920 .. | 275,000 | 80,089,435 | 11,307,652 | 291.0 | 7.06 |
| 1923... | 300,000 | 69,377,682 | 11,507,383 | 231.0 | 6.02 |
| **Oakland** | | | | | |
| 1910... | 236,600 | 60,907,667 | 11,542,069 | 257.0 | 5.28 |
| 1920... | 338,000 | 76,165,524 | 13,596,738 | 225.0 | 5.60 |
| 1923... | 428,000 | 76,265,053 | 14,001,634 | 178.0 | 5.44 |
| **Atlanta** | | | | | |
| 1910... | 154,839 | 44,908,137 | 9,538,867 | 290.0 | 4.72 |
| 1920... | 200,616 | 77,284,154 | 13,521,623 | 386.0 | 5.72 |
| 1923... | 222,963 | 75,518,711 | 13,721,310 | 341.0 | 5.50 |
| **Omaha** | | | | | |
| 1910... | 155,984 | 44,062,280 | 8,541,354 | 282.0 | 5.16 |
| 1920... | 191,601 | 72,055,229 | 11,606,066 | 376.0 | 6.20 |
| 1923... | 200,000 | 56,063,792 | 9,714,460 | 280.0 | 5.78 |
| **Birmingham** | | | | | |
| 1910... | ........ | ............ | .......... | ..... | .... |
| 1920... | ........ | ............ | .......... | ..... | .... |
| 1923... | 227,000 | 41,676,029 | 9,734,653 | 183.0 | 4.28 |
| **Syracuse** | | | | | |
| 1910... | 145,000 | 29,434,855 | 5,558,482 | 203.0 | 5.30 |
| 1920... | 175,000 | 38,516,968 | 4,988,158 | 220.0 | 7.74 |
| 1923.., | 195,000 | 33,397,922 | 5,115,735 | 171.0 | 6.53 |
| **Richmond** | | | | | |
| 1910... | ........ | ............ | .......... | ..... | .... |
| 1920... | 171,667 | 46,611,097 | 8,011,242 | 272.0 | 5.82 |
| 1923... | 181,044 | 42,402,172 | 8,648,160 | 234.0 | 4.92 |
| **New Haven, Hartford** (Connecticut Company Lines) | | | | | |
| 1910... | 700,000 | 114,637,728 | 21,735,270 | 164.0 | 5.28 |
| 1920... | ........ | ............ | .......... | ..... | .... |
| 1923.., | 875,395 | 147,095,935 | 26,042,077 | 168.0 | 5.65 |
| **Memphis** | | | | | |
| 1910... | ........ | ............ | .......... | ..... | .... |
| 1920... | ........ | ............ | .......... | ..... | .... |
| 1923... | 185,000 | 44,364,521 | 7,615,424 | 240.0 | 5.82 |
| **San Antonio** | | | | | |
| 1910... | 105,000 | 17,672,690 | 3,900,305 | 168.0 | 4.53 |
| 1920... | 161,000 | 25,817,759 | 5,965,509 | 160.0 | 4.33 |
| 1923... | 175,000 | 25,620,300 | 6,106,189 | 146.5 | 4.20 |
| **Dallas** | | | | | |
| 1910... | 92,104 | 22,560,710 | 3,387,170 | 245.0 | 6.65 |
| 1920... | 165,318 | 54,039,071 | 7,541,252 | 327.0 | 7.17 |
| 1923... | 195,000 | 51,179,356 | 7,819,530 | 262.0 | 6.54 |
| **Houston** | | | | | |
| 1910... | 78,000 | 19,341,738 | 2,950,567 | 248.0 | 6.56 |
| 1920... | 167,000 | 35,506,499 | 5,679,197 | 213.0 | 6.26 |
| 1923... | 175,000 | 31,454,596 | 6,388,247 | 180.0 | 4.93 |
| **Grand Rapids** | | | | | |
| 1910... | 87,500 | 21,797,159 | 3,745,529 | 249.0 | 5.81 |
| 1920... | 150,000 | 27,813,220 | 4,105,070 | 185.0 | 6.78 |
| 1923... | 153,500 | 23.103,961 | 4,008,945 | 150.0 | 5.79 |
| **Salt Lake City** | | | | | |
| 1910... | ........ | ............ | .......... | ..... | .... |
| 1920... | ........ | ............ | .......... | ..... | .... |
| 1923... | 153,000 | 28,201,400 | 5,401,710 | 184.0 | 5.22 |
| **Norfolk** | | | | | |
| 1910... | ........ | ............ | .......... | ..... | .... |
| 1920... | 115,777 | 33,686.867 | 4,837,742 | 291.0 | 6.97 |
| 1923... | 159,089 | 27,479,653 | 5,549,964 | 172.0 | 4.91 |
| **Des Moines** | | | | | |
| 1910... | 86,368 | 20,838,654 | 4,294,093 | 241.0 | 4.85 |
| 1920... | 126,468 | 37,059,271 | 4,084,950 | 293.0 | 9.08 |
| 1923... | 128,234 | 31,468,382 | 5,552,706 | 245.0 | 5.65 |
| **New Bedford** | | | | | |
| 1910... | 103,963 | 8,145,072 | 2,311,426 | 78.0 | 3.52 |
| 1920... | 131,754 | 24,824,255 | 2,459,333 | 185.0 | 10.10 |
| 1923.., | 150,500 | 26,722,574 | 2,574,192 | 178.0 | 10.40 |
| **Trenton, N. J.** | | | | | |
| 1910... | 105,027 | 15,815,457 | 3,259,469 | 150.0 | 4.85 |
| 1920... | 129,223 | 19,277,044 | 3,624,857 | 149.0 | 5.32 |
| 1923.., | 138,566 | 20,620,688 | 3,672,879 | 149.0 | 5.62 |
| **Nashville** | | | | | |
| 1910... | 100,000 | 24,399,365 | 4,813,816 | 243.0 | 5.06 |
| 1920... | 135,000 | 33,978,322 | 5,538,284 | 251.0 | 6.14 |
| 1923.., | 150,000 | 31,360,750 | 5,291,417 | 209.0 | 5.94 |
| **Albany-Troy** | | | | | |
| 1910... | 247,069 | 39,705,150 | 8,600,314 | 160.5 | 4.62 |
| 1920... | 259,668 | 46,499,820 | 8,082,938 | 179.0 | 5.75 |
| 1923.., | 269,353 | 44,778,521 | 6,846,496 | 166.0 | 6.54 |
| **Spokane** | | | | | |
| 1910... | 104,402 | 20,700,191 | 3,621,213 | 199.0 | 5.72 |
| 1920... | 104,437 | 25,923,261 | 5,680,608 | 248.0 | 4.57 |
| 1923... | 104,437 | 23,167,019 | 5,246,535 | 222.0 | 4.42 |
| **Tacoma** | | | | | |
| 1910... | 84,000 | 23,551,966 | 3,718,349 | 281.0 | 6.34 |
| 1920... | 96,965 | 24,199,332 | 4,762,242 | 250.0 | 5.08 |
| 1923.., | 108,250 | 27,728,954 | 5,194,816 | 256.0 | 5.34 |
| **Duluth** | | | | | |
| 1910... | 78,466 | 16,485,822 | 3,081,810 | 210.0 | 5.35 |
| 1920... | 98,917 | 29,522,912 | 3,786,852 | 299.0 | 7.80 |
| 1923... | 110,000 | 25,014,521 | 3,739,709 | 227.0 | 6.70 |
| **Utica** | | | | | |
| 1910... | 77,000 | 13,755,270 | 2,804,517 | 179.0 | 4.91 |
| 1920... | 97,000 | 20,142,301 | 3,024,441 | 208.0 | 6.66 |
| 1923.., | 103,000 | 17,260,289 | 3,169,587 | 168.0 | 5.48 |
| **Erie** | | | | | |
| 1910... | 75,000 | 7,218,739 | 1,757,597 | 96.0 | 4.11 |
| 1920... | 110,000 | 18,077,572 | 2,733,134 | 164.0 | 6.61 |
| 1923.., | 110,000 | 16,257,922 | 3,396,743 | 148.0 | 4.79 |
| **Knoxville** | | | | | |
| 1910... | ........ | ............ | .......... | ..... | .... |
| 1920... | ........ | ............ | .......... | ..... | .... |
| 1923.., | 90,000 | 15,421,147 | 2,330,071 | 171.0 | 6.56 |

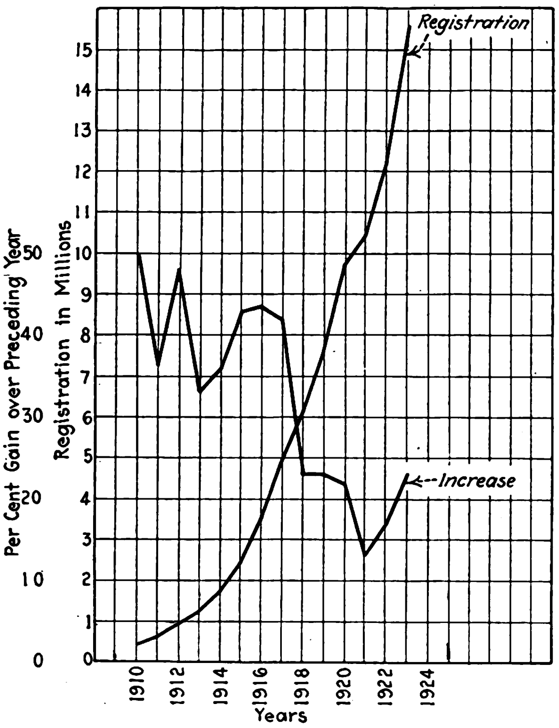


**Fig. 2—Motor Vehicle Registration in the United States, Shown in per Cent Increase Over Each Previous Year, and Total**

TABLE II—SUMMARY OF THE SURVEY OF 48 URBAN ELECTRIC RAILWAYS, 1910-1923

| Year | Population Served Total | Population Served Per Cent of U. S. | Revenue Passengers Total | Revenue Passengers Per Capita | Revenue Car-Miles | Passengers per Car-Mile |
|---|---|---|---|---|---|---|
| 1910 | 22,668,997 | 24 | 5,057,490,715 | 223 | 913,507,826 | 5.54 |
| 1920 | 27,492,592 | 26 | 7,179,510,162 | 261 | 1,011,508,730 | 7.09 |
| 1923 | 31,574,147 | 28 | 7,715,148,223 | 244 | 1,084,339,392 | 7.12 |

TABLE III—PASSENGER STATISTICS FOR UNITED STATES, AS GIVEN BY U. S. CENSUS BUREAU, 1890-1922

| Year | Revenue Passengers | Increase in Revenue Passengers Over Preceding Period Total | Increase in Revenue Passengers Over Preceding Period Per Cent |
|---|---|---|---|
| 1890 | 2,023,010,202 | ............ | ..... |
| 1902 | 4,774,211,904 | 2,751,201,702 | 136. |
| 1907 | 7,441,114,508 | 2,666,902,604 | 56. |
| 1912 | 9,545,554,667 | 2,104,440,159 | 28.3 |
| 1917 | 11,304,660,462 | 1,759,105,795 | 18.4 |
| 1922 | 12,655,300,050 | 1,360,639,558 | 12. |

TABLE IV—MOTOR VEHICLE REGISTRATION IN UNITED STATES BY YEARS, 1890-1923

| Year | Registration | Per Cent Gain Over Preceding Year |
|---|---|---|
| 1910 | 468,497 | 50.0 |
| 1911 | 639,514 | 36.4 |
| 1912 | 944,000 | 47.8 |
| 1913 | 1,258,062 | 33.0 |
| 1914 | 1,711,339 | 36.0 |
| 1915 | 2,445,666 | 43.0 |
| 1916 | 3,512,996 | 43.6 |
| 1917 | 4,983,340 | 42.0 |
| 1918 | 6,146,617 | 23.0 |
| 1919 | 7,565,446 | 23.0 |
| 1920 | 9,231,941 | 22.0 |
| 1921 | 10,463,295 | 13.0 |
| 1922 | 12,238,375 | 17.0 |
| 1923 | 15,092,177 | 23.0 |

the country, billions of dollars were expended in the developments necessary to secure maximum use.

The nation, states, counties and cities have each gladly contributed toward highway building; and necessity has revolutionized paving methods of our city streets and roads.

Publicity has been so ably handled and presented that the city fathers in each city vie with each other to discover some new improvement in facilitating traffic handling. Individual ownership of automobiles and trucks has enabled auto traffic to secure a preference in traffic guidance over street car traffic that is not enjoyed by the car riders, who constitute the mass of the travelers. However, the railway representatives are making progress toward fairer and more logical traffic regulations.

### EFFECT ON STREET RAILWAY SECURITIES

In 1910 electric railway securities were held in high favor by bankers and the investing public. The troubles, fancied and real, caused by the war and the increased use of the automobile have resulted in an unfavorable reaction, the net result being that many people have believed electric railway service is being supplanted by the private automobile and the bus. They have honestly felt that universal service can be rendered by these units. This general feeling caused talk among those who, if they stopped to think, should have known what a serious thing it would be to have any good form of transportation put out of business.

The future of each form of transportation will be determined by economic conditions based on the actual service rendered and the cost of that service. The automobile is just beginning to be affected by economic conditions that will be more apparent in the next few years. Even now there is a slackening of the rate of their manufacture. It is hardly to be expected that the actual needs of the country would admit of the absorption of automobiles at the rate at which they were manufactured in 1923. However, with trucks the situation is entirely different. The national good roads program leads many to believe that the truck and bus business is still in its infancy.

These conditions cause bankers to look with disfavor on electric railway securities. With the same selling effort they can make much more money handling other classes of securities. They also believe, due to the antagonism the street railway business has faced in the past, that these other securities are in reality a safer investment.

The operating companies have been the object of almost every known form of attack. Managements have been accused of watering their stocks, of mismanaging their properties, of not giving a service comparable with that furnished by the automobile and the bus. They have been accused by the press, by the public and the

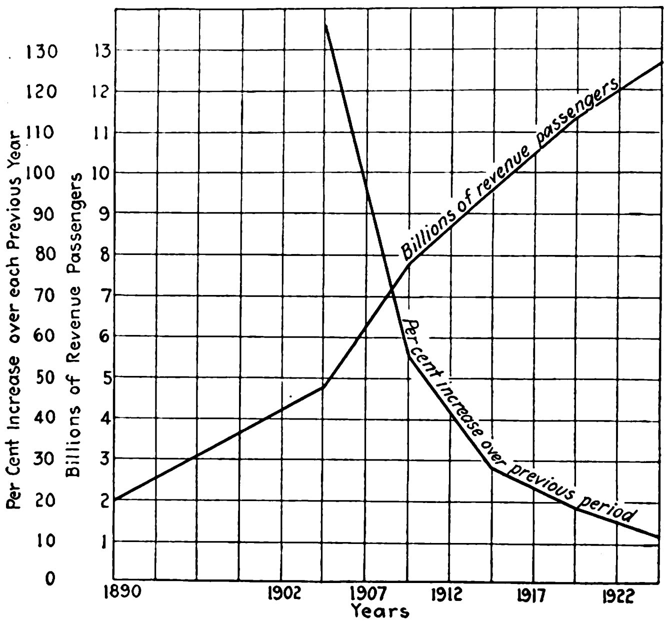


**Fig. 3—Revenue Passengers Carried by the Electric Railways of the United States, and per Cent Increase in Number of Rides Over Each Previous Five-Year Period**

politicians of making vast sums and concealing the profits. This unfortunate procedure was advanced by the belief of many people that street railways, being a natural monopoly, were extremely profitable. While in some cases large sums of money were made from stock manipulation, the great majority of the companies never more than earned reasonable return on the actual investment.

Street railways have been taxed all over the United States in every conceivable way. Why they should be made a tax collector is hard to see. Street railway taxation is necessarily a discriminating method that is put on the car rider and not shared by users of other forms of transportation. If not collected in money it is necessarily reflected in the grade of service. It will take time and proper presentation of the railway case to correct this unfavorable discrimination.

At the present time practically all street railway securities are on the bargain counter, but these traffic figures show that many if not all of these companies have a good, safe financial future. Many of them, due to the feeling just described, have not been able to secure capital to put them in the physical condition to make real money.

There are some notable exceptions to this doleful picture, where the vision and courage of the guiding spirits in some of the companies have led to notable financial and operating records.

It will take time for the investor and the banker to realize these facts. The unwillingness to lend influence to obtain investments now in certain selected street railway securities and aid the cause will mean a lost opportunity for many investors.

The seriousness from an investment standpoint is shown by the following approximate tabulation of the capital invested in public utilities. Telephone and telegraph, $2,000,000,000; gas, $4,000,000,000; electric railway, $6,000,000,000; power and light, $6,000,000,000.

There are light and power company combinations which have looked upon their rails apologetically. This feeling, however, is tempered with the fact that every large community must have street railway service to attain its natural community growth and thereby create the largest market for power and light.

### POPULARITY OF SECURITIES GOES IN CYCLES

It is true that first one class of security and then another enjoys popularity at the hands of the investor. Street railway securities enjoyed this favor in 1910, since when they have gradually declined. But since the service rendered is an actual public necessity we can rest assured that time will bring about a more equitable evaluation of these properties; and greater efficiency in conducting the business will again bring prosperity and create a demand for their securities.

As a rule railway men have been too modest and sometimes too pessimistic. They see what is apparently an avalanche of competition in the form of the automobile. Statistics in several large cities show that in downtown districts only 10 to 25 per cent of the people riding use automobiles and the other 75 per cent to 90 per cent use the street cars.

The slackening in the trend of per capita riders, mentioned earlier, seems unlikely to continue, since the other vehicles that are crowding the streets and taking away street car passengers are themselves creating a situation of traffic congestion that cannot continue indefinitely. When this point is reached, and it is coming soon, the riders will come back to the street railway as the cheapest and most efficient form of mass transport known, provided, of course, the managements give the service they must to attract the riders.

One of the most serious problems of the street railway in the past has been to serve these outlying districts, which are necessarily the forerunners of populous centers.

In such instances the automobile and the bus can be a timely help to the street railways, by giving a good reliable form of transportation to sparsely settled communities. When these districts are built up they will need mass transportation, which the rails can then supply at a profit.

### CONFIDENCE IS BEING RE-ESTABLISHED

The American Electric Railway Association, guided by its president and others, is sowing the seed of confidence in the electric railway industry, based on the records made by their own properties. The industry has withstood a rough siege of recent economic conditions. Old cars have been operated over old tracks, both needing attention. To do the necessary repair and replacement work capital is needed, which only the investor can supply. It is a safe statement that the records of these companies will in the future receive the attention and help of the investment banker and the public.

The automobile gives the de luxe service of transportation. It is high-class individual service. The street car is on a quantity basis, organized and standardized to meet the needs of the masses rather than those of the individual; and the service is sold at the lowest possible price. It therefore handles the bulk of the transportation business; it is the poor man's automobile; it is the vehicle for the provident business person to use going to and from work.

The bus as we have it today gives an intermediate class of service, which is not within the economic province of either automobile or the street car.

Every community should give each of these three forms of transportation every possible encouragement so that each may fill its true economic place.

In giving the service of the street car and the bus, the outstanding problem to enable them fully to serve the public is to transmit courtesy and leave the feeling with the rider that the entire transportation organization is doing all it can for the comfort of each individual.

In reality, carrying out this idea by the men, the management and the investor is the thing that will put the street railway again in the favored class for investment. When communities realize this they will again popularize the service.

Why do we have so much kicking about street railway service? Why at times do we have such controversies? Why do the qualifications edge in at every opportunity? Why do so many individuals give up their time to attend meetings and public service commission hearings? Why are the newspapers always ready to give front page space to any large or small item that affects the local transportation system? The reason is that these facts and their effects have an almost universal personal interest. These problems constitute real news, because the street car service means so much to the personal comfort of the vast majority of the people. One of the reasons for compiling the data on which this article is based was to secure a standard of rides per capita and rides per car-mile which will form the foundation for investigation and study to increase the value of the service which the different street railway companies of the country can render.

It is believed in time electric railway service will be recognized as one of our most essential and popular public utilities and, therefore, that the new capital necessary for improvements will be obtained and the investment protected. The reason for this belief is:

1. Street railways render a service that is necessary for communities to grow. No other form of transportation yet devised supplants it for mass transportation, although it is true that the automobile and the bus supplement the service; and it is believed that in time they will render a form of transportation that will relieve the street car companies of unprofitable commitments. With each unit filling its own economic field, each class of service will be furnished at the lowest possible cost.

2. The results of this survey show that even with the marvelous automotive development and all the facilities that have followed that development, the electric railway is still having an increasing passenger business. These results are substantiated by records of the Census Bureau.

3. The lash of competition is causing the leaders of the electric railway industry to study their business from a basic standpoint. From the sincere way in which they are going after the job it is reasonable to assume that the future will bring about progressive changes, and it further is reasonable to expect that the public will become convinced of this fact.

4. Street railway service fills an actual public necessity. That is why people complain when the service does not suit them. The people need it and take a personal interest in it. That is the reason why they talk about it. Modern busy people do not talk about things that do not interest them.

5. Summing up all sides of the question, it is believed that the electric railways will continue to render a recognized popular service and their securities will again be in favor with the investor.

# Detroit Conducts Test Laboratory

### Investigations and Analyses Are Conducted of All Supplies Purchased, Including Coal, Overhead Material, Track Material, Oil, Paint, Etc.—Satisfactory Results Are Being Obtained and They Have Suggested Changes in Certain Specifications

THE laboratory of the Department of Street Railways, Detroit, is well equipped for checking the quality of supplies received. During the two-year period since the city has operated the entire railway system in Detroit 2,147 separate pieces of work have been taken care of in this laboratory. Besides these regular analyses and tests, considerable research has been undertaken in developing better methods for checking the quality of supplies received, investigating the possibility of using new materials, the redesigning of old forms of equipment, etc.

## ANALYSIS OF COAL FOR POWER STATIONS AND CARS

Coal for the power stations is purchased on a specification basis, with penalty clause for fuel falling below a certain established value. During the term of one contract, covering a period of about ten months, approximately $7,000 was recovered by the department from the contractor for coal, because of tests made in the laboratory. This instance is one of the cases where the laboratory can definitely state in concrete terms the amount of savings effected.

Investigations of the matter of coal supply, as well as analyses, have also been conducted by the laboratory. Thus, during the coal strike of two years ago the various coal mines in Michigan were visited in order to see if coal could be obtained from them in sufficient quantities and if it could be used in the power stations. One car load was obtained and burned with fairly satisfactory results.

A large percentage of the older cars are warmed with stoves using coal as a fuel. Investigations were conducted to determine the size and character of the various fuels that could be successfully used in these heaters. The use of Michigan peat and various mixtures of coke and anthracite were tried. Every car load of fuel to be used in the heating of the cars is inspected by the laboratory before being unloaded. The results obtained in the heating of the cars during the past winter amply proved that this method of studying the matter of car heating was worth while.

An instance may be cited to illustrate the statement that all of these investigations are not carried on in the laboratory: On a number of the coldest mornings of the winter members of the laboratory staff inspected the cars before they went on the line in the early morning. This meant that these members of the staff had to be at the carhouses by 4 a.m. Conditions were found by such an inspection that led to certain recommendations which materially bettered the heating of the cars when first going into service, as was proved by later inspections.

## ALL SUPPLIES ARE TESTED

Owing to a clause in the city charter making it obligatory to advertise for bids on materials exceeding $500, it is necessary to have specifications for the various supplies used, in order that the vendors may intelligently submit bids covering the material in question. By subjecting the material on receipt to rigid tests, the department is safeguarding its own interests and incidentally the interests of all reliable vendors, thus eliminating the "just as good as" seller of questionable goods. It has been the experience of the department that the lowest bidder is not always the cheapest in ultimate cost, due to checking and rejecting and again checking a second or a third shipment.

As a rule it may be said that the method of advertising for bids on a specification basis and then checking up on the shipment has proved satisfactory. That this constant checking has not been without results is shown by the following: During the first six months of city operation 19.2 per cent of all galvanized material was rejected, and for the corresponding period one year later only 5.4 per cent failed to prove acceptable. This is further evidence of the value of systematic checking.

The subject of trolley wire is one of vital importance to all railways. It is the practice in Detroit to test a sample from each reel of trolley wire received, the specification being one drawn by the department. Its specifications for trolley wire are somewhat similar to the standard A.E.R.E.A. specifications, but a higher tensile strength is specified than by the A.E.R.E.A., and there is also included an upper limit for elongation. The torsion clause remains as in the A.E.R.E.A. specification.

Considerable difficulty was experienced at first in obtaining wire under the new specifications, as some shipments would meet the specifications 100 per cent, while the next shipment from the same wire mill would fall in quality as low as 33 per cent of acceptable wire. This difficulty apparently has now been overcome, as the wire mill found that copper from a certain refiner gave 100 per cent good wire, while that from another refiner gave the low results. Both coppers were pure copper in a commercial sense, the difference in quality of the wire being caused evidently by faulty temperature control in the pouring of the ingot at the refinery.

This indicates that defects in copper wire may originate at a point previous to its receipt at the wire mill, although the wire mill is apt to be accused of supplying low grade wire when the real cause is further back in the production of the copper.

Surprising results were obtained from further tests, made on the amount of current that No. 00 hard-drawn copper trolley wire could carry without annealing. It was found that a piece of No. 00 wire would carry 1,000 amp. for 30 minutes with a loss of only 2 per cent in tensile strength if air from an electric fan was blown across the wire to dissipate the heat. If, however, the fan was not run, there was a loss of 23 per cent in 5 minutes and 38 per cent in 30 minutes. In the case where the fan was on, the elongation was increased about 25 per cent, while in the case where the fan was off the elongation increased 937 per cent. From these tests it is not difficult to visualize what may happen to trolley wire on a hot, still day with heavy cars located close together and all starting at once.

Considerable work has been done, and investigations are still being continued, along the lines of testing high strength trolley wire, the effect of splices on strength, elongation and torsion, etc.

### BARN HANGERS AND JOINT PLATES INVESTIGATED

A few cases occurred in Detroit of the stud holding the trolley ear pulling out of its insulation in mine or barn hangers, caused apparently by the softening of the insulation. An investigation along this line proved that some barn hangers, if heated to 43 deg. C. (110 deg. F.) softened to such an extent that if a load of 100 lb. was applied to the stud it would fall out of the insulating material. At the same time under the same conditions other insulation remained intact at 129 deg. C. (264 deg. F.).

This led to the insertion of a clause in the department specifications covering mine or barn hangers that: "The stud shall remain fixed in the straight line hanger, when a load of not to exceed 100 lb. is applied to the stud, and when the hanger is heated to 65 deg. C. for one hour." This clause is original with the department, as far as is known.

Work has been done in Detroit, in the laboratory and outside, and more is in progress at present, to find out what type of joint plate will weld best to rails and also what its composition and that of the welding wire used should be. A number of combinations of joint plates and rails, using a variety of welding wires in making the test joints, are being fabricated, and when these are complete physical and chemical tests will be made of these test joints as well as photomicrographs of cross-sections. The object of this research is to obtain a better joint if possible.

In its general work in joint welding the department is working toward the general specifications of the American Welding Society as outlined in its bulletins, as follows: (1) Standards for testing welds. (2) Welding wire specifications and folios. (3) Standards for arc welding apparatus. (4) Training course for oxyacetylene welders. (5) Welded pressure vessels. (6) Applications of arc welding to ship construction. (7) Training course for electric arc welders.

### EXAMINATION OF UNDERGROUND CONNECTIONS

Along the lines of work for the welding division in Detroit the laboratory has also conducted tests on the carrying capacity of bare feeder when buried in the ground, with especial reference to a soldered joint. A soldered T-splice was made on 750,000-circ.mil bare feeder and a box was built around it to act as an insulator and to keep air currents from cooling the solder. Current was then passed in the leg of the T and taken off from both branches. The initial current was 1,500 amp. for 10 minutes, when no effect on the solder was noticed through the glass top fitted into the box over the joint. The current was then increased to 2,800 amp., when a material warming was immediately noticed, and resulted in the solder melting in 10 minutes more. The solder started to melt on the leg of the T-joint first.

The object of this test was to determine the safe carrying capacity of such joints and how much overload could be applied temporarily on special track work jumpers when laid in the ground.

### WEATHERING TESTS FOR PAINT

Paints are analyzed to some extent, but the test upon which chief reliance is placed is an actual weathering test. Steel panels 6 in. x 12 in. are painted with the paint under consideration, and such qualities as ease of mixing, tendency to settle in the can, hiding power, flowing or brushing qualities, etc., are noted and recorded, as is the length of time required for drying. The panel is hung outside, where it comes in contact with fumes and gases such as are given off from the power stations near by, and their effect, the fading effect of sunlight and the action of rain are noticed. This test is continued until a breakdown of the paint film occurs. The test is necessarily long, but it has been the experience in the laboratory that a surprisingly large number of paints break down within one year, thus enabling a weeding out of the poorer paints within a reasonable length of time.

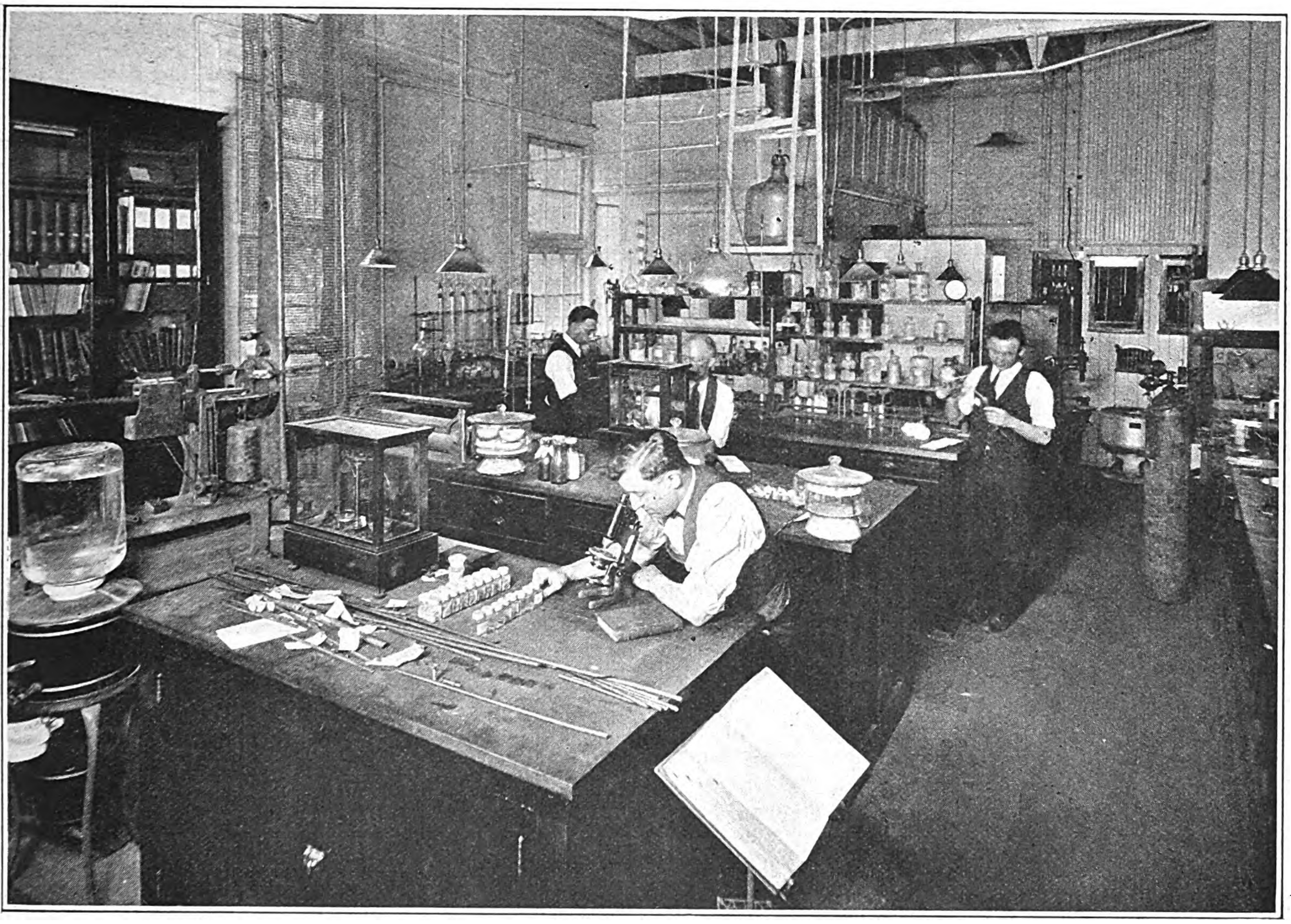
Since November, 1920, the department has kept, in all cases of paint purchases, a record of the vendor, type of paint, cost and where applied. The service given by these paints has also been periodically checked by the laboratory, with the result that certain paints have been eliminated for future use.

Another test given paints is for their covering power, which is found by weighing the sample of paint, painting a steel panel 3 ft. square and then reweighing the remaining paint. From this is calculated the amount of metal surface that 1 gal. of the paint will cover.

It has been found that some paints will cover as high as 350 per cent more area than others. Obviously, this quality materially alters the original relative costs of paints.

### CAR AND TRANSFORMER OIL ANALYZED AND OTHER TESTS

Every shipment of car oil is analyzed, as is the babbitt and bearing metal used in repairing the car journals and motor bearings. A considerable number of different types of car roof ventilators have been tested and show a wide divergence in their ability to "ventilate." Some handle as high as 100 per cent more air than others. It was found with all types of ventilators that the amount of air removed from the car bears a certain relation to the speed of the car; that is, as the speed increases the volume of air removed increases.



**The Laboratory Passes on All Railway Supplies Used in Detroit. Considerable Savings Have Been Made and Specifications Have Been Changed as a Result of the Investigations Made Here**

The subject of transformer oil has brought to the department the need of a uniform, workable specification for an oil of this character. Samples have been submitted by various vendors and when the contracts were awarded to them the actual shipments have failed to meet the specifications. This might possibly be attributed to the fact that the low bidders were firms that do not specialize in oils of this character. It emphasizes the necessity of checking receipts of goods.

A number of different types of paving brick and concrete have been tested for the track department, thus enabling this department to choose from actual data rather than from claims made by vendors.

The quality of cloth to be used in making overcoats for the motormen and conductors has been thoroughly investigated, as has the possibility of refinishing tarnished uniform buttons. The relative merits of linoleums and the wearing qualities of various types of metal fare tokens have also been successfully investigated to conclusion. Such work requires natural Yankee ingenuity, as there are no prescribed methods or apparatus for this type of work that will give results of definite value.

Fire extinguisher liquid is stored and dispensed for the entire system by the department, as are first aid supplies, there being 65 first aid cabinets distributed over the properties.

Scrap and salvage are also frequently analyzed, thus enabling the department to obtain a better price for this material.

Below is a list of various work performed in the laboratory or by its personnel:

Coal and ashes for power house
Coal and ashes for car heating
Oils and greases
Feedwater
Fire brick and fire-clay
Combustion conditions
Trolley wire
Line fittings
Galvanizing
Paints
Insulators
Hangers
Tape
Cement
Rope
Soaps and cleansers
Linoleum
Welding wire
Rails
Joint plates
Steel ties
Copper bonds
Insulating paints and varnishes
Bus bars
Distilled water (obtained from department power house)
Babbitt
Electrolytes for lightning arresters
Bearing metals
Trolley wheels and shoes
Soils
Car wheels
Brake shoes
Overcoats
Waste
Lead-covered cable
Weatherproof feeder
Messenger wire
Paving blocks

Building brick
Gasoline
Lamp cord
Mica
Brazing wire
Solder and soldering pastes
Boiler compounds
Tools
Wood preservatives
Grate bars
Valves
Shellac
Storage battery sludge

While the laboratory operates as a branch of the electrical department, it is used by all departments of the railway and has done some work for other city departments.

The laboratory is housed in a brick structure 20 ft. x 40 ft., to which an additional 50 per cent in floor space is being added. This addition is under construction at present and is about 50 per cent complete. It will materially relieve the present cramped quarters.

The major apparatus for physical testing consists of:

One 30,000-lb. capacity Olsen tensile strength testing machine
One Riehle cement tester
One Olsen Brinell hardness tester
One portable Brinell hardness tester
One Atwater bomb calorimeter
One Pitot tube
One centrifuge
One muffle furnace
One rattler or tumbler for abrasion test on paving brick
One recording portable thermometer (for flue gas)
Orsats
Anemometers
Complete photomicrographic outfit
Drill press
Lathe
Grinder

The organization consists of four men, including R. E. Hunt, chief chemist.

# Some Definite Evidence of the Bankers' Changing Attitude

### Letter Sent Out to Salesmen by Investment Banking House Reveals New Thinking with Respect to Electric Railway Securities

THE following is taken from two recent letters sent out by a prominent investment banking house to its salesmen. It is published herewith as concrete evidence of the things which we have been saying along the line that investment bankers were beginning to look upon electric railway securities with more favor. The antipathy to electric railway securities is certainly diminishing, and rightly so. The letters follow:

Since the first of January there have been three unusual pieces of financing that commanded national attention—in spite of their relatively small size. These include:

$4,000,000 Maryland Electric Railways first and refunding mortgage gold bonds, Series A, 6½ per cent, due Jan. 1, 1957; brought out by Rollins and Alex Brown & Sons; $13,000,000 Market Street Railway first mortgage 7 per cent sinking fund gold bonds, due April 1, 1940, brought out by Dillon, Read & Company and Ladenburg, Thalmann & Company, and $3,200,000 Grand Rapids Railway first mortgage 7 per cent sinking fund gold bonds, due May 1, 1939, brought out by the Federal Securities Corporation, Dillon, Read & Company and Spencer Trask & Company.

Getting back into the street railway financing in the larger centers means three things:

1. That the dead line of the 5-cent fare has been crossed successfully and the increased fare has not seriously affected the number of passengers carried.

It is notable here that the elevated lines in Chicago increased their traffic 12 per cent in 1923 over 1922, and the 1924 results are showing an increase of 8 per cent over 1923. This is in spite of improved conditions in the street railway lines and heavy increases in that traffic.

2. The public, either through the Public Utility Commissions or the local city administrations, have established a policy of "live and let live" and recognize the fact that capital invested in street railways must be compensated in order to attract more capital and improve service.

3. It takes for granted that in spite of other methods of locomotion—such as steam trains, jitneys, bus systems, taxicabs, and privately owned automobiles, the street and elevated railways are essential to the growth, prosperity and general business of any large city.

Obviously, until all of these points had been settled satisfactorily there could be no public financing of street or elevated railways, and yet progress has been made so rapidly that we know of two instances at least where not only has bond financing been possible but preferred stock campaigns for customer and employee-ownership are under way. Very naturally such a campaign successfully concluded would go a long way toward changing the attitude of politicians and the public generally toward the important companies.

It is probable that it will be unpopular to bait corporations where stockholders number many important constituents, whose employees are largely interested in the financial welfare of the company, and where an honest effort is made to serve the public efficiently.

Doubtless the attitude of the street and elevated railway lines themselves has also undergone change during this period of sacrifice and difficulties and the idea that "the public be damned!—especially aldermen" is undoubtedly passing away. This point is largely a question of management anyway. In Chicago, the surface lines have always been at loggerheads with the city but the elevated lines have always been on good terms with city and public.

We believe these questions deserve very careful consideration from the members of our firm, and I commend these and other comments to follow to your careful thought.

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There are some interesting figures available for the relative number of passengers carried by the street railways and other methods of carrying people in and around cities.

Judging by the amount of space used and congestion caused by automobiles and buses, it would almost seem that a large proportion of the traffic was being carried by gasoline vehicles. From an actual count, however, in Grand Rapids at a given corner 36½ per cent of the passing traffic was carried by automobiles and 63½ per cent by street cars. This is in spite of the fact that 9½ per cent of the vehicles passing were street cars and 90½ per cent automobiles. In Chicago, the Chicago Surface Lines advertise that more than 70 per cent of the people traveling on the surface—that is, not on the elevated or steam roads—travel on the street cars, while approximately 20 per cent travel by automobile.

Delay in street railway transportation for the greater number, increased congestion and inconvenience in the central part of the cities themselves, and unsatisfactory parking laws, will undoubtedly eventually bring about strict ordinances preventing automobiles from entering certain parts of the city at certain hours of the day. This will tend to get more people into "the street-car-riding habit."

There is no question in the mind of any one who has watched this congestion that jitneys and automobiles cannot take the place of the street railway service. It may be a supplement—and a desirable one—but in growing cities of 50,000 or more population, where the distances from home to work are increasingly greater as time goes on, the street car is again going to come into its own as the only sure, convenient, regular, satisfactory method of transportation for the greatest number.

Street railway securities have been for many years in disrepute. The Tractions, when spoken of by the wise ones in financial centers, usually brought a smile almost as cynical as that produced when we mentioned Timbers and Irrigations a number of years ago. The public memory is very short, however, and in the markets of the next few years it will be remembered and pointed out:

1. That tremendous amounts of uncapitalized earnings have gone back into these properties during these periods when neither bonds nor stocks could be floated. In the year 1923 alone, $282,000,000* was expended on the purchase of materials for maintenance, expansions and improvements.

2. That the Tractions are essential to the life of any great city and, as such, are entitled to a fair return on the investment.

3. In any growing community business must increase, irrespective of jitney bus and automobile competition, thus from 1917 to 1923 automobile passenger car registration increased from 5,191,000 to 12,880,000 and during this period the passengers carried on electric railways increased from 14,500,000,000 to nearly 16,000,000,000.

Investment houses will all again be extolling the merits of traction bonds.

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*See ELECTRIC RAILWAY JOURNAL for Jan. 5, 1924, page 4.

# Association News & Discussions

## Psychology Replaces Technology

### Forty-second Annual Meeting of the New York Electric Railway Association Discusses Public Relations and Publicity—History of Motor Bus Operation in Baltimore Is Told—Attendance Sets a New Record

THE fact that, as one speaker said, "Psychological problems have now largely replaced technical problems in the electric railway industry" was demonstrated by the number of speakers who discussed public relations and publicity from various angles at the forty-second annual meeting of the New York Electric Railway Association held at Long Beach, L. I., on June 21. The ball was started rolling in this direction by P. L. Thomson, publicity manager Western Electric Company, New York City, and president Association of National Advertisers, who declared that if the public has the wrong idea about the electric railways, it is the fault of the electric railway men themselves. The best way to drive out a bad idea is to replace it by a good idea. Mr. Thomson's talk appears in abstract elsewhere in this issue.

At the banquet in the evening R. B. Woodward, secretary Rochester Chamber of Commerce, Rochester, N. Y., said that there is at the present time a tendency to feel that things are going to the dogs because public opinion has too much influence. Some people believe it would be better if we had less democracy in the world today—that a good executive clothed with ample authority could manage affairs better than is the case when so many questions are submitted to the public for decision. However, we are headed toward more democracy rather than less, in the opinion of Mr. Woodward. That being the case, the public utilities must educate the people to have a more sympathetic attitude based on a better understanding of the utility problem. For that reason engineering problems in the electric railway industry are now secondary in importance to the problem of establishing good public relations.

This same note was sounded by R. S. Binkerd, vice-chairman of the committee on public relations of the Eastern railroads, speaking at the banquet, who said that the fundamental problem today is a psychological one. The object of public relations activity is to educate the people for economic good citizenship. A strong point was made by Mr. Binkerd when he said that if the work which is performed annually by the railways of this country, utilizing energy of millions of horsepower, were actually done by the horses, the public would not try to starve these animals the way it tries to starve the machinery doing this job. The reason that they try to starve the railways is that they have never been taught how completely dependent they are upon the transportation systems. The public must be made to understand that the railways need their fair share of the national income if they are to keep on doing their work properly.

The service that the manufacturer performs for the industry was the theme of a paper presented by E. P. Waller, manager railway department, General Electric Company. An abstract of this paper appears elsewhere in this issue. In the discussion A. J. Manson, manager transportation department, Westinghouse Electric & Manufacturing Company, made the point that the manufacturers, besides carefully studying the problems of their customers and trying to solve them from the technical angle, have also engaged in advertising before the general public, to point out that its interests will be best served by helping the railway industry rather than by attempting to restrict its development. The fact that the employees of the manufacturer occupy the position of disinterested third parties to the controversy increases the effectiveness of the work that they can do. Efforts have been made to educate the stockholders of the manufacturing companies by inclosing constructive messages at frequent intervals with their dividend checks.

The story of how the motor bus is used as an auxiliary to street railway operation in Baltimore was told by L. H. Palmer, vice-president and general manager United Railways & Electric Company. Mr. Palmer's paper will be published in a future issue. In discussing this paper V. E. Keenan, superintendent bus department United Electric Railways, Providence, R. I., said that transportation companies contemplating bus operations should not be misled by the attractive appearance of the body, the performance of the engine and chassis being the primary considerations, rather than the looks of the vehicle. Mr. Keenan said that maintenance costs on buses of different types varied widely, and that the electric railway should not be used by bus manufacturers as an experimental field wherein to try out new types.

Electric arc welding was the subject of a paper by A. M. Candy, general engineer Westinghouse Electric & Manufacturing Company. Mr. Candy made the point that welding operations on electric railways have not been standardized to the extent that they should be. He suggested that a manual on welding should be prepared by the American Electric Railway Association. In this view J. W. Hulme, assistant superintendent car equipment, Interborough Rapid Transit Company, New York City, concurred. In his opinion successful welding depends upon the human element to the extent of 85 per cent, and on the equipment used to the extent of 15 per cent. The necessity of giving proper training to welding operators is therefore apparent. It requires from three to four years for a man to master the blacksmith trade, but when a railway decides to undertake welding operations in many instances a likely man is picked for the job, given a few instructions and is then expected to produce good welds. An even more common practice is simply to hire a man who claims to be a welder and put him in charge of the welding shop. Proper training of the men and careful organization of the work is essential if good results are to be accomplished.

A careful study should be made to compare the cost of repairs by welding and the cost of new material. It is surprising, according to Mr. Hulme, to find how often work which is done by welding shows an apparent saving when, if carefully checked up, it is found that there is really no saving at all over the purchase of new parts. The following items should be taken into consideration when calculating the cost of repairs made by welding: Overhead, cost of handling, life of weld, proportion of breakage, cost of labor, cost of electric current, and cost of welding rods. An example of welding work that is not really worth while, in the opinion of the speaker, is that of salvaging worn steel car wheels.

The meeting was opened by an address by the president, Edwin Duffey. A brief report was read by the secretary and treasurer and then the various committees reported. The paving committee announced that it had been unable to find any suitable sponsor to present to the Legislature its bill for relief from paving obligations. The accounting committee announced that it has devised a uniform system of subaccounts. J. P. Barnes, president Louisville Railway, Louisville, Ky., who was scheduled to present a paper on public relations and publicity, was unable to be present.

At the close of the meeting R. F. Carbutt asked for the co-operation of the members present in the preparation of an electric railway handbook on which he is now at work. A vote of thanks was given to the entertainment and program committees and to the Hotel Nassau for the contributions they had made toward the success of the meeting.

A larger attendance than at any previous meeting of the New York Electric Railway Association marked this convention. Just prior to the banquet, which was held Saturday evening at Castle's Garden, more than 350 members had registered. A feature of the program was the entertainment for the ladies. This included, through the courtesy of Major-General R. L. Bullard, commanding the Second Corps Area, a visit to Mitchel Field, and an inspection of the hangars and general aviation activities. On Saturday afternoon there were card games for the ladies and golf for the men.

Officers of the association elected for the coming year are: President, C. E. Morgan, vice-president and general manager Brooklyn City Railroad; first vice-president, W. J. Harvie, vice-president and general manager Auburn & Syracuse Electric Railroad, Auburn; second vice-president, W. W. Foster, secretary-treasurer and general manager Rochester, Lockport & Buffalo Railroad, Rochester; secretary-treasurer, W. F. Stanton, assistant to president New York State Railways Rochester.

The executive committee for the ensuing year will consist of these officers and Frank Hedley, president Interborough Rapid Transit Company, New York City; Harry B. Weatherwax, vice-president United Traction Company, Albany; J. F. Hamilton, president New York State Railways, Rochester, and S. W. Huff, president Third Avenue Railway, New York City.

In his speech of acceptance as incoming president Mr. Morgan called attention to the fact that Mr. Hazzard, president Brooklyn City Railroad, was first president of the New York Electric Railway Association, 42 years ago. Since then no official of the Brooklyn City Railroad has been president of the association until the election of Mr. Morgan.

# It's Your Own Fault*

By P. L. THOMSON

Publicity Manager Western Electric Company and
President Association of National Advertisers

YOU have asked me to come here as a critic. That is not an easy rôle to fill, because I confess at the outset to only a layman's knowledge of the transportation business. But even so, what I have to say may not be without its value to you if it represents what the public generally thinks about the street railway business.

Above all, as a critic, I want to be fair. In the first place I find myself of two minds in relation to street railways as I know them. On the one hand, as a member of the electrical industry, connected as I have been for more than 21 years with a great company which serves the street railway industry in an important way, I recognize that you have rendered a necessary service to your public, that you are entitled to a fair return upon the capital which has been invested in your property, so that you may prosper and go on increasing the measure of your service. On the other hand, as a man on the street, I don't care about any of these things. I don't even know if they are true. I know that when I use your service it makes me sore. I pay 8 or 10 cents where I used to pay a nickel, I have to hang on a strap, jam myself into standing room, and put up with incivility from your employees and the indifference of your management to my personal discomfort. I therefore prefer to ride in the jitneys, which are faster, and when your employees strike I find myself hoping the strikers will win. To some degree this represents, I am afraid, the public's attitude toward street railways.

It isn't fair, you say. Of course it isn't fair. But who is to blame if the public has the wrong idea about your business? Why, nobody but yourselves. The way to drive out a bad idea is to put a good one in its place. We have heard it said over and over again that the public will deal fairly, if they know the facts. There isn't anything new, therefore, in the plea to give them the facts. But I may be able to throw some light on what it is you ought to say, how you ought to say it and when you ought to say it.

First, as to what you ought to say. Well, it seems to me the fundamental message which the street railway industry hasn't put over to its customers is that their welfare and its welfare are closely linked together. Their relationship is not that of foes. They ought to be partners in a great enterprise. I have been going around the country this year talking to some advertising clubs and business organizations on the general topic of "The Business Man and His Public Utilities," and I have been amazed to see the interest stirred up by some of the things I have said, perfectly self-evident things to you and me, bearing upon the dependence of the people in any community on the utilities which serve them.

I told them how we had come to have a monopoly in the rendering of most utility service—electric light and gas and telephone and street railways—and I told them why a monopoly if regulated is the right way to provide this service, right not only from the point of view of the public service organization, but right from the customer's point of view. "Monopoly" is a bad word. You know it has a bad sound and your political agitator likes to roll it over his tongue and tell what he will do to monopoly if the voters elect him to office. Now, as a matter of fact, until you public service organizations clear up the stigma which attaches to that term it will continue to be seized upon by politicians as a basis for attacks upon you. It isn't a difficult story to explain, but it is just one of those bad ideas that has got to be replaced with a good idea.

I have told my audiences how a manufacturer looking for a location in a community inquires at the very outset what facilities the town affords for adequate power and transportation. A man won't locate a factory off in the outskirts of a community where he is dependent upon the trolley system to get his employees to and from the factory if that trolley company is in the hands of receivers or is threatened with financial disruption because the people of the town won't let it earn a fair return on its investment. And many a city has lost a prospective industry because it didn't appreciate that its welfare lay in the direction of helping its utilities to live instead of throttling their earning power, in order to save a few pennies on its monthly light or telephone bill or a few cents on its car rides.

I have told about Toledo and what happened to the retail business there when the street cars quit. You know that story, but have you ever told it to the people who ride on your cars and who vote your franchise? That strike of the street car company, you remember, came to an end when the people of the community petitioned the Council to grant a reasonable franchise and get the cars back on the city streets. And John N. Willys said at the time, "This lack of street cars is costing Toledo $50,000 a day, and it is costing the people and retail storekeepers ten dollars to every one it costs the street car company." I believe the public will listen to facts like these. Are you quite sure you are telling them?

When you trace the evolution of street railway management down to the present system of a regulated monopoly you can point out that government and municipal regulation of utilities came to put an end to the abuses of overcapitalization, cutthroat competition and other ills of the past, that this idea of regulation made a hit with the public because they felt that their interests were going to be safeguarded against the unfair advantage which capital might take of them. They didn't realize at the time that regulation would work both ways, that it would protect the interests of the investor as well as the user of the service. Therein lies the primary selling value of your securities. Given this common interest between the people of a community and the prosperity of the utilities which serve them, what is more logical than that the money to provide for the necessary growth and extensions to the utilities' service should come from the pockets of the citizens of that community who are looking both for service from their utilities and for a good place in which to invest their savings? You have then the argument for customer ownership, a class of securities which are safe because their issues are controlled by a regulating body which will make sure that the street railway gets such a franchise as will enable it to earn continuously a fair return upon its valuation.

The companion picture to that is the movement for employee ownership of securities, and these figures constitute an interesting story for you to tell to your public because it will give them a new respect for your employees who come into contact with them, and it will give those employees a new sense of pride in the character of the institution which they represent.

You have been making some interesting history in the street railway business the past five or six years. Experiments of public ownership have been tried and have usually failed, competition has been tried and failed, unregulated motor bus interference has been tried and generally has failed. The specific story of what happened in Seattle, in Des Moines, in Toledo, in Akron, in Bridgeport and elsewhere will make interesting reading for your patrons and will help to give them a new regard for the service which you are rendering.

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*Abstract of a paper presented at the meeting of the New York Electric Railway Association, Long Beach, L. I., June 21, 1924.

### Railways Have Interesting Story

You have an interesting story, too, on the financing of your business, particularly if you reduce your balance sheet to terms which can easily be understood by the average patron. Tell him how the 7 cents or the 8 cents which he pays for his ride is spent by you, what part of it is for labor, how much to generate the current, how much for depreciation on the plant, for maintenance, how much for the use of the money you borrow on your bonds, and then show him what is left as your margin of profit, and put the question squarely: "Is 6 cents a year on the dollar which you have to invest an exorbitant profit? Is it even a fair profit in a business with all the hazards of operating a city transportation system?" Tell your riders what it costs you for your taxes, your paving bill, your street sprinkling and your snow removal. Tell them the story of how your wages have risen in a decade or two, of how your equipment has improved, of how much you pay for a street car now and how big it is compared with the cars you operated when you first got your franchise. Out in Akron they are telling that story in the newspapers now, but they waited until the franchise expired and the City Council declined to renew on a more favorable basis.

Of course, the strategy in this whole matter of better public relations is to tell the story yourself as something of which you are not ashamed. Don't let them get it from the other fellow, who may garble the facts and misrepresent your motives. That franchise in Akron, taken out twenty-five years ago, called for one car on Main Street every 10 minutes up to 10 o'clock at night and one car every 20 minutes after that until 1 o'clock in the morning, with no cars at all between 1 and 5 in the morning. Would the people in Akron have been satisfied with that kind of service? Would the city have grown if the street railway officials had stood on its rights and furnished only that much service? Obviously not. They got bigger cars, they laid heavier rails, they ran cars under a shorter headway, and all of these things cost money. The only thing which didn't go up was the nickel they collected for a fare, and that went down in buying power to somewhere between 3 and 4 cents, and yet the people of Akron were expecting to get twice as much car service for a fraction of the cost. It couldn't be done, of course, and now out of that situation will, I understand, come a new franchise which will recognize that adequate service must be paid a fair price.

Tell some of the problems of operating a great system, of how you buy your coal months in advance and store several months supply so as not to be caught short in the event of a strike. Tell how your load factor varies and what is involved in getting the factory crowd home on Saturday at 1 o'clock or the theater matinée crowd home at 5 o'clock, with all those extra cars and the investment they represent idle during the rest of the day.

And then you have a wonderful story to tell about your personnel, the men in the system, the care which you use to select them and train them, all in the public's interest, so that they may ride safely in cars that are sanitary, and be treated always with courtesy. As I go around the country I can pretty nearly spot the character of the street railway management by the appearance of its motormen and conductors and by their manner toward their passengers. Where there is neatness in appearance and courtesy in address, bespeaking a high morale, there is good service to the community, and that town recognizes its good service and appreciates it. I remember one line in the state which operates one-man trolleys, and I remember that town because I can't get out of my mind the way the motorman kept sliding the door open every few blocks to spit tobacco juice out of the side. When you begin to talk in the newspapers about your employees, what a good crowd they are, and you mention some of them by name who have a long record of faithful service and you set up an ideal, you'll be amazed to see the reaction that kind of publicity has on the whole crew.

### Where to Tell the Story

Now as to what mediums of publicity to use. Use them all. Obviously you will use newspapers to tell your story, and, controlling as you do another excellent medium, the street cars, you will have an attractive series of cards on the inside and on the outside of the cars and on the window panes telling from time to time the multitude of interesting things that you are doing in the interest of better transportation for your customers.

But the best public relations job is done by the company that has the greatest number of personal contacts with the public, from the president down. You executives ought to take at least one opportunity a year to talk to your Rotary clubs or your chambers of commerce, your advertising clubs, or Kiwanis, or Elks, or Lions. You ought to have several men on your staff who can talk interestingly of your system before other luncheon clubs, women's clubs, church clubs and the like. Organizations of this character are always on the lookout for speakers with a real story to tell. Why not get a motorman and conductor to put on a talk in behalf of your company? You would be amazed at the oratorical talent which you could uncover. These fellows now do all their oratory in the meetings of the labor union. Why not give them a chance to tell a real story, and if you find they don't know enough about the business to do that, then it is time you taught them.

There are other media too, the most recent of which is the radio. I don't know why that isn't a field which you could use. I have recently been talking about utilities over the radio, they tell me, to millions of listeners, and I don't care if 900,000 of them turned the knob on me, I still have enough letters from all over the United States to prove that there were a lot of them listened in and were interested. Perhaps the secret of this talk on the air is that I tried to put it in terms of self-interest to my audience. I made it apparent that I had no axe to grind, I was talking the gospel of community harmony in order that they as individuals, as business men or as farmers might see that it was to their own advantage to stop quarreling with their utilities and help them grow and prosper in order that they in turn might prosper and find this a more comfortable world to live in.

What kind of relations do you enjoy with your newspapers? Do you know the editors personally? Have you ever called on them in their own offices? Do you yourself or does anybody on your staff make it a point to call them up when something important happens—a new issue of securities, the expected arrival of ten new type street cars, the decision of your board to extend one of the lines, a good record made in restoring service after a break, a human interest story about one of your employees who has completed twenty-five years of service? Editors appreciate attentions of this sort and will invariably meet you more than half way if you indicate that you want to help them get interesting news and get it straight. Editors and reporters are human beings just like you men, and if you treat them fairly they are the best friends you have in the town.

Now the last question is When, and you have already anticipated the answer to that. All the time. That is when. There isn't any such thing as an advertising campaign. I dislike the term. You can no more have an advertising campaign than you can have a breathing campaign. Just try to breathe for an hour and then stop for a couple of hours. That is the trouble with most of you utility people. In the first place, you wait until you are on the defensive, a franchise which has expired, an attack which has been made by some self-seeking politician, and then you start to defend yourselves. When you do your public relations job right you won't be on the defensive. When you sell the people of your community on the integrity of the management of your street railway system, the quality of service, the high grade of men who work for you, and some of these other things which I have been mentioning, then you will have insured yourselves against political agitation. The political agitator is no fool. He keeps his ear to the ground to find out what will be a popular slogan. When either because your service is bad, or not being so bad just because you have no positive standing with your public, he thinks he can get votes by attacking you, then just as long will you be subject to attack. But when you set apart as one of the major objectives of your business the building of sound public relations and you put in charge of that job an executive officer—he ought to be at least a vice-president—and give him competent assistance and an adequate appropriation, then you are insuring your future against the agitator's attack.

A few weeks ago I was up in New England talking before an advertising club and the utility people. The city was in the throes of a jitney fight. Eleven thousand people had signed postcards at drug stores petitioning the Council to let the buses run unregulated on the streets paralleling the street cars. In the course of my remarks I told those people that they couldn't eat their cake and have it too. Dealing with the elementary economics of the situation, I pointed out how the street railway couldn't possibly live if the jitneys were allowed to pick off the cream of the business and pay no share of the expense. I told them, as I believe to be true, that street cars are the answer for moving large groups of people in our urban centers, that it is the history of American transportation that the best results are secured when buses are used not to compete with the trolley lines but as feeders for them under the management of the trolley companies themselves. Well, all that seemed to be news up there in that town because the reporters who were present quoted me at some length in the papers, and when I went to the street railway company afterward and asked the officials why they hadn't told that story, their reply was simply that they didn't have any advertising appropriation and couldn't afford to tell the story. Within the past week, however, I learned today from the director of the advertising section of the American Electric Railway Association, the railway company has decided to inaugurate an advertising and publicity department. This is well, but somewhat late.

And right at this point I want to appeal to you to make more use of the association's advertising section, as the company mentioned is now doing. As doubtless all of you know, this section not only supplies a regular advertising service to every electric railway company in the country but its director is available at all times to give advice and suggestion on your specific problems, without charge. This service has been at your disposal for more than three years. You have been urged through the trade magazines, in personal letters and in speeches before your convention to make use of the association's facilities, and if you have not done it certainly the blame lies with none but you.

I also want to say a word about the importance of state committees on public utility information. These committees, performing an excellent service, now operate in about 35 states. There is one in New York, but the electric railway industry is not represented on it. I understand that strenuous efforts have been made both within your industry and within the committee to have electric railway representation on that committee, but that action has been deferred time and again. Let me say that this is a grave mistake. I care not whether your membership associates itself with the present New York committee or starts a new committee to handle electric railway work exclusively—something should be done now.

Now, I haven't mentioned any figures; I don't know how much you ought to spend, but I know that you ought to spend more. I can't attempt to set up a ratio of what your advertising appropriation ought to be to your gross revenue, but you ought to spend enough to do the job. Three hundred street railways spent $2,000,000 last year on public relations activities. It will be more this year. That means that some of you are doing a job that is undoubtedly adequate. But more of you are not, and of course you are the ones who are most in need of public good will.

# How the Manufacturer Is Helping the Electric Railway*

By E. P. Waller

Manager Railway Department, General Electric Company

WHEN a manufacturer sells a piece of equipment to an industry he is furnishing to that customer not only a certain amount of materials fabricated into a machine but he is furnishing also the thoughts, ideas and experiences of the designers and builders. In the long run it is this thought and service, and the ability of the manufacturer to give more than so many pounds of machinery to his customer, that govern the volume of sales.

The electric railways have recently passed through a period of stationary receipts and of mounting wages and material costs. This period emphasized the need of service from manufacturers to their hard-pressed customers, and, in general, the manufacturers need not be ashamed of the response. This period saw many economies and methods of increasing the earnings introduced and worked out by the operators. It also saw many valuable results in the same direction worked out by the manufacturers. For instance, the Birney safety car is directly adding some $17,000,000 to $18,000,000 to this year's net earnings of the more than 400 companies using it, and the same principle of one-man operation extended to other city and interurban cars is effecting a further saving of some $4,000,000.

Another important development which occurred during this period was the low-wheel light-weight interurban and city cars which are in use on more than half a hundred city and interurban properties. These cars are directly adding more than $5,000,000 to this year's net earnings of the companies using them.

### DEVELOPMENTS IN POWER SUPPLY

Two decades ago each railway had its own power station, equipped with small generators, driven by reciprocating engines. The largest units were not over 5,000 kw. capacity; the majority were much smaller. The minimum fuel consumption of these plants was from 5 to 6 lb. of coal per kilowatt-hour; the average probably 7 or 8 lb.

The development of the steam turbine with large high-speed units has made possible a reduction in the fuel to 2 to 3 lb. per kilowatt-hour. In addition, in many cases, it has been found that a railway by purchasing power cannot only save itself the initial power investment, but actually can obtain a lower rate from the central station.

The development of high-tension oil switches and insulators have made possible an increase in transmission voltages up to a maximum of 200,000 volts. This has resulted in great economies in the transmission of power and also has enabled railway companies to purchase power more reasonably.

A somewhat similar development has occurred in railway substations. Twenty years ago heavy low-speed 25-cycle converters were in universal use. These had a high first cost and took up a great deal of valuable floor space. They could not be tied into the 60-cycle circuits of large central stations. Then the 60-cycle converter was developed and improved. The high-speed circuit breaker helped decrease flashovers resulting from surges or short circuits.

Automatic substation control in connection with reliable converting apparatus today shows a lower record of failures or interruptions than the ordinary station with manual operation. Its use not only saves the wages of station attendants, but also reduces light-load losses, and by reason of its load limiting equipment, prevents interruptions and increases the load factor. It also permits the railway company to distribute its converting machinery to better advantage, as a greater number of substations can be installed, they can be located closer together and with a better regard to the center of gravity of the load and with a large saving in overhead copper. In this way trolley disturbances can be restricted to a comparatively short section of track, and the failure of a complete substation feed no longer cripples service as was the case where a bank of machines fed a network through a single artery or duct. Furthermore the improvement in voltage that results, particularly in outlying districts, makes possible higher-speed schedules, with resultant economies in platform wages.

### IMPROVEMENTS IN MOTORS AND CAR ACCESSORIES

Railway motors which were in use 18 or 20 years ago were of the non-ventilated, non-commutating pole type. These motors were brought in for general overhauling three or four times a year, because the armature bearings would not last longer than three or four months. While these or similar motors are still in service on many roads, they have been given the advantage of many developments that have materially helped their performance. They have been provided with heat-treated gears and pinions; bronze bearings with tin-base babbitt liners; slotted commutators, and higher grade brushes as well as a better system of oil and waste lubrication. But even so, recent records show that their average maintenance cost is $3.50 to $5 per 1,000 motor-miles, or from $120 to $175 per motor annually.

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*Abstract of a paper presented at the meeting of the New York Electric Association, Long Beach, L. I., June 21, 1924.

The modern box-frame ventilated motor with commutating fields, high-grade insulation, improved brush-holders, bearings, and gearing, weighs 30 to 40 per cent less for a given working capacity or for a given car weight to be handled, and so saves in first cost. Moreover, its average cost of maintenance, as shown by records in every part of the country is only 50 cents to $1 per 1,000 motor-miles, or from $18 to $35 per motor annually, directly saving the railway company several hundred dollars on each car it operates. Indirectly they save additional amounts because of their greater reliability.

Two electrical manufacturers during the year 1922 sold 9,090 modern railway motors of 25 to 70 hp. These motors had an approximate weight of 14,820,000 lb. and a cost of approximately $9,400,000. The same number and sizes of the old non-ventilated motors would have weighed 24,850,000 lb., and based on the same material and labor prices would have cost the railways $13,550,000. These figures indicate that the economies obtained in one year due to railway motor development resulted in 10,000,000 lb. less weight to be carried on the rails, and $4,150,000 less investment charges. The annual saving would be about $600,000 in fixed charges, and at least as much more in operating expenses.

Moreover, the development of the low-wheel motor permitted the car builders to make changes in their designs that reduced weights and initial cost in bodies and trucks, and which went a long way toward absorbing the tremendous increases in labor and material costs brought about by the war. In other words, the 16,000-lb. safety car today does not cost very much more than the 24,000-lb. single-truck car of equal capacity did ten years ago; and a 25,000-lb. 44-passenger double-truck car can be bought for about the same as its 44,000-lb. predecessor could then.

Multiple-unit control for train operation has undergone radical changes. It has been simplified and made more positive in action, and is lighter, cheaper and far more reliable.

### AIR BRAKES

Much that has been said of railway motors applies to the air compressor, and similar improvements have been made in its design. Chief among these are better insulation, better lubrication, and better protection for the motor against the admission of oil. The whole design is lighter and more compact.

In the automatic air brake, the trend has been toward quicker and more uniform action on the long trains used in rapid-transit service, and toward the use of an electro-pneumatic valve to obtain simultaneous and immediate application on every car.

One of the really striking applications of air has been in the safety devices which contributed so materially to the success of the one-man safety car. The working out of this apparatus, which automatically opens the power circuit, applies the brakes, sands the rail and unlocks the doors in case of the operator becoming incapacitated, has proved a most effective argument with public service commissions and legislative bodies.

Economies have been effected in many shops by the use of labor-saving tools and machines, but too large a proportion of railways have not yet taken full advantage of the developments in this direction, and are neglecting the savings in cost of repairs, or in the effectiveness of repair work, that they might obtain with better shop equipment. Many devices have been worked out and perfected for railway shop service. These will save many times their cost.

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# A. R. A. Exhibits Largest Ever Held

## Equipment and Supplies for Rolling Stock and Shops Formed a Most Imposing Display at the Recent Convention in Atlantic City—Many Improvements in Machine Tools Shown

THE exhibits held on the Million Dollar Pier, Atlantic City, N. J., by the Mechanical Division of the American Railway Association, June 11-18, surpassed all previous records of the association. There were a total of 375 exhibitors occupying a space of 103,000 sq.ft. The most impressive feature was the extent and variety of the machine tools shown. Fully 40 per cent of the exhibits were shop tools and a large proportion of these were shown in actual operation. Heavy-duty modern machines equipped with high-speed steel cutters and new devices to increase production with decreased effort were performing such operations as turning axles, boring wheels, milling bars, grinding guides, pressing in bushings, forging rods, planing various parts and punching and shearing steel plates.

The exhibits of drilling machines were particularly interesting since such a large amount of the work in electric railway shops consists of drilling operations. Improvements in design included new safty features such as entirely inclosed gearing, foolproof elevating mechanism and simplified lubrication.

There were many exhibits containing lathes and improvements consisted of the use of multiple-tool posts so that different diameters can be turned at the same time and a more substantial and rigid construction of the carriage and beds to prevent chattering. Improvements in oiling and safety features were also in evidence.

A single spindle horizontal boring mill made by the Lucas Machine Tool Company, Cleveland, was of particular interest to electric railway shop men who have the problem of reboring motor shells. With vertical adjustment of the boring bar and both transverse and longitudinal adjustment of the swiveling table and with micrometer dials for all adjustments extreme accuracy is assured.

A type of portable boring bar manufactured by the H. B. Underwood Corporation, Philadelphia, can also be used to advantage for reboring motor shells. Power for driving this equipment is obtained from an air motor driving a spindle which in turn meshes with a gear keyed to the boring bar. After the equipment is applied the tool can be adjusted in the cutter head by tightening a collar screw. A gage provides a simple method of setting the tool to the required position.

Exhibits of shapers and planers showed arrangements of control and adjusting levers on one side of the machines to provide for easier and more rapid setting up of work, increased strength of various parts and provisions for rapid reverse speed. One design of Gould & Eberhardt, Newark, N. J., had a jib crane attachment as a self-contained unit.

A new design of wheel boring mill shown by the Consolidated Machine Tool Corporation of America, Wilmington, Del., was provided with double hoists of the pneumatic type, one located on each side of the machine so that handling can be done from both sides. The motor is operated by a reversible automatic controller with a push button station convenient to the operator. The opening of the chuck jaws as well as the starting and stopping of the table are all accomplished by push button control. Feeds for roughing and finishing are obtained through sliding gears which may be changed while the machine is running. The feed can also be changed from roughing to finishing as soon as the roughing cutter clears the work.

A number of different designs of forcing press were shown. These included hand or screw types, hydraulic and other auxiliary power presses. These machines do a large variety of work and are a convenient accessory for any electric railway shop. Their use includes the pressing in and out of arbors, mandrels, bushings, shafts, pins, compressor cylinder linings and valve seats; the bending or straightening of rods, bars and structural material, as well as broaching and punching operations. One type shown by the Lucas Machine Tool Company, Cleveland, had a pressure holding device for stacking armature laminations, assembling commutators and like operations. This attachment holds the ram in the lowest position to which it is advanced by use of pawls and a ratchet wheel, the latter being keyed to the hand wheel pinion shaft. A pedal throws the pawls out of engagement so the press can be operated without using the attachment.

There were also several exhibits containing grinding machines. The Production Machine Company, Greenfield, Mass., showed a new surface grinding machine of the abrasive belt type. The abrasive belt runs over a cushion leather belt with herringbone corrugations on its face. High and low points are thus provided. The high points are used for cutting and the low points immediately adjoining for chip clearance. A pressure platen operating on the back of the cushion belt serves to bring the belts to the work. A table with a power feed roll provides for the use of various fixtures. The rate of feed is regulated by the angle of the feed roll, which is adjustable. The machine is used for the external grinding of cylindrical shapes.

### WELDING EQUIPMENT SHOWN

There were numerous exhibits of welding equipment, but not as many as are usually shown at the electric railway convention. An exhibit of gas cutting with the torch fastened to one bar of a pantograph device was shown by the Air Reduction Sales Company, New York, and attracted considerable attention. This device assists in cutting plates, forgings or castings accurately to shape. The machine also provides an economical consumption of gas, as the speed of cutting and the gas supply are regulated to the thickness of metal and finish desired.

A portable electric arc welder shown by the General Electric Company, Schenectady, consisting of a motor and a generator, was shown in operation. The generator voltage with this set can be adjusted to the work. Thus high voltage can be used for complete penetration on heavy work and low voltage to prevent burning on light work.

A rather unusual design of tip for oxyacetylene cutting torches was shown by the Alexander Milburn Company, Baltimore. The tip permits supermixing of the gases and preheating of the cutting oxygen. An added velocity and penetration is also given to the preheating and cutting jets.

A new type of welding electrode was of tapered form to prevent undesirable heating. The manufacturer was the Electric Arc Cutting & Welding Company, Newark, N. J., and stated that the gradual increasing diameter allows a corresponding increase in deposition with a constant heat value in the work. The electrodes are tapered by a rolling and swagging process and are coated after being shaped.

Another unusual type of electrode had a central metallic core surrounded by a layer of flux which is inclosed by an outer metallic layer. It was exhibited by the General Electric Company, Schenectady. The sheath prevents the flaking off of the flux in handling and reduces the dissipation of the flux by the arc. Increased stability of the arc is one of the claims made for the use of this type of electrode.

### OTHER EXHIBITS

An excellent opportunity to study the various types of electric locomotives and improved construction of dump cars was afforded by the track exhibits, which were placed on the Philadelphia & Reading tracks at the Boardwalk and Mississippi Avenue. A Chicago, Milwaukee & St. Paul locomotive which had been in service for four years on the Cascade division illustrated the most modern type of gearless passenger locomotive for operation on 3,000-volt direct current. The Pennsylvania Railroad exhibited two locomotives at North Providence Terrace. The electrical parts for these locomotives were supplied by the Westinghouse Electric & Manufacturing Company. These electric locomotives are the largest type built by the Pennsylvania. One was a freight locomotive and has been in service for several months at Philadelphia, operating from 11,000-volt alternating-current overhead trolley. The second locomotive is a passenger type for use in service at the Pennsylvania terminal, New York, and operates from a 650-volt direct-current third rail. The motors on both types of these locomotives are identical, so that by changing the gear ratio and control apparatus the freight locomotive can be made suitable for passenger service and the passenger locomotive for freight service.

Equipment for serving various machine tools and for handling material was very much in evidence. A new type of pit jack shown by the Watson-Stillman Company, New York, N. Y., was arranged for use in connection with a drop top or transverse table. It is self-contained except for the necessary connections to the shop air line and can be operated by one man. Air is used to operate the hydraulic pump and to traverse the track in the pit. Hydraulic pressure is obtained by a two-plunger pump. All gears and chain drives are protected with sheet-metal guards.

A large variety of industrial trucks was shown, and shop men were impressed by the ease with which heavy units can be handled and placed by the use of such trucks. Types with elevating platforms and with low platform and crane mounting are particularly useful in railway shops. The designs shown were arranged for short turning to meet the conditions of crowded shop areas and narrow aisles.

A portable car hoist was shown by the Whiting Corporation, Harvey, Ill. This consists of a motor-driven screw jack, mounted in a substantial frame. A toggle arrangement raises the jack so that it can be pulled from one location to another on wheels like a small truck. The portable hoist can be used under any type of car and also to hold the car in its raised position, since power is required to lower the load. The hoist will thus support the car without blocking. By the use of two of these jacks one end of the car can be raised at a time, or with four jacks the car body can be raised as a unit.

There were many exhibits of truck and brake rigging parts, but most of these were for freight equipment or steam road service. A new design of truck journal box, exhibited by the National Malleable Castings Company, Cleveland, was provided with ribs inside for retaining the waste in proper position. An exhibit of pressed steel brake shoe heads by the Buffalo Brake Beam Company, New York, showed the advances which are being made in this respect, and an improved forged strut for holding the brake beams accurately spaced and the shoes for wheels on the same axle in proper position was shown by the Bradford Corporation, Chicago.

There were also numerous exhibits of car trimming, seating and miscellaneous car equipment parts. These, however, were arranged with particular reference to steam road service. Im-

# American Association News

## New Officers Nominated

AT THE executive committee meeting in New York on June 20 L. H. Palmer reported for C. D. Emmons, chairman of the committee on nominations, as follows:

For president, J. N. Shannahan, president Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va.

First vice-president, F. R. Coates, president and general manager Toledo, Ottawa Beach & Northern Railway, Toledo, Ohio.

Second vice-president, W. H. Sawyer, president East St. Louis & Suburban Railway Company, East St. Louis, Ill.

Third vice-president, R. P. Stevens, president Republic Railway & Light Company, New York.

Fourth vice-president, J. P. Barnes, president Louisville Railway.

Treasurer, Barron Collier.

For members of the executive committee: Harry Reid, president Interstate Public Service Company, Indianapolis, and C. E. Morgan, second vice-president and general manager Brooklyn City Railroad, Brooklyn, to represent the railways; E. P. Waller, manager railway department General Electric Company, Schenectady, and B. A. Hegeman, Jr., president National Railway Appliance Company, New York, to represent the manufacturers.

## Special Reports Available

THE Bureau of Information and Service of the American Electric Railway Association has prepared the following reports, which are available to member companies in good standing upon request:

*Wage Bulletin 128* (Revised Edition) —A new edition of the Wage Bulletin which combines in one compilation the original bulletin issued Oct. 1, 1923, and all of the monthly supplements showing changes to June 1, 1924.

*Traffic Ratios, Part I: City Lines*—The cities (about 150) have been listed according to their size, beginning with New York, and for each city there is shown the riding habit (revenue rides per inhabitant served), the average speed, revenue passengers and car-miles per mile of track and per car operated, revenue per mile of track, operating ratio, passengers per car-mile, proportion of transfer passengers and operating income per mile of track.

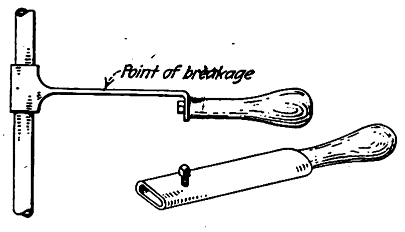
*Selected Exhibits Presented by Electric Railways in Wage Arbitration Proceedings*—These exhibits were selected from various arbitration cases to illustrate methods actually used in presenting data on such questions as: Wages in relation to cost of living; relation of trainmen's wages to wages in other local industries; nature of trainmen's work and skill required; average wages earned; size of trainmen's families; effect of wage increase, etc.

In addition to the above, supplements to the Fare Bulletin and Cost of Living Studies have been prepared.

# Maintenance of Equipment

## Emergency Door Handle Saves Pull-ins

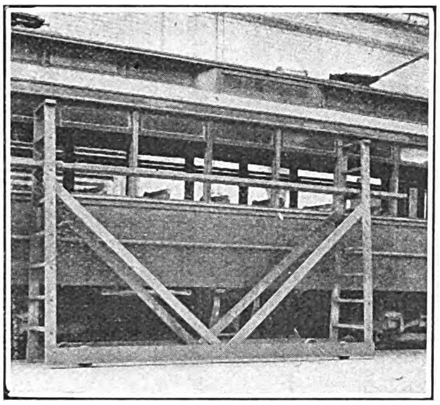
A SPECIAL operating handle for platform doors has been devised by the Nashville Railway & Light Company, Nashville, Tenn., for use in case the regular handle breaks. Platform doors are opened and closed by an arrangement of levers and a vertical rod in front of the motorman. This rod is turned by a wooden handle attached to a casting which encircles the rod. Castings occasionally break through the narrow part, which is between the vertical rod and the handle. When this happens it is still possible for the motorman to operate the doors, but it is rather difficult to use the short stub of the handle and the usual result is that the car is turned in at the carhouse and another car substituted. To prevent this an emergency handle has been designed, made from a piece of pipe slightly larger than the small part of the casting and flattened to an oval shape. It can be slipped over the broken end and fastened in place by a setscrew. As soon as word is received of a broken door handle, one of these emergency handles is rushed to that car and after it has been put in place the car can continue operation all day.



If the Door-Operating Handle Breaks an Emergency Handle Is Fastened to the Broken End

## Rolling Platform to Paint Car Roofs

TO FACILITATE the work of painting the roofs of cars, the Georgia Railway & Power Company, Atlanta, has built a rolling platform, as shown in the accompanying illustration. The practice of this company when repainting cars is to spray paint below the belt rail and to use a hand brush above that line. Although there are comparatively large areas of the roof which could be spray painted, the company feels that it is more satisfactory to do this work by hand, particularly in the case of monitor deck cars.

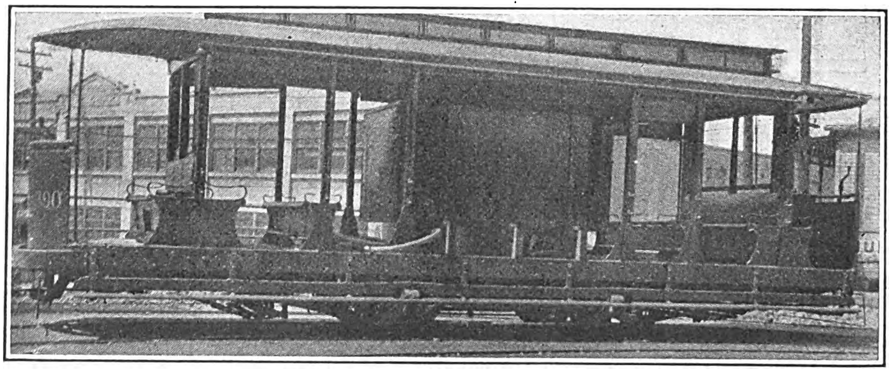


Painters' Platform Which Can Be Rolled Along at the Side of a Car as Progress of Work Demands

The framework of the platform is of wood and is mounted on four cast-iron wheels. This apparatus is very easily moved and the painter can change its position along the side of the car by grasping the car body with one hand and the framework with the other and pulling the platform to the desired position. This has proved to be much more satisfactory than a stationary platform.

## Carrying Water to Small Concreting Jobs

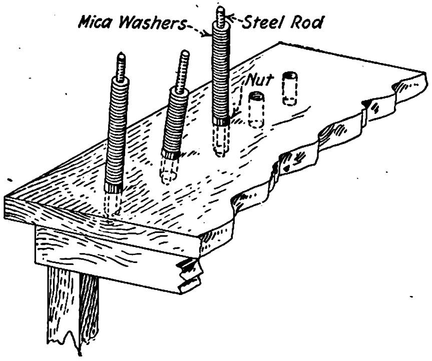
AN OLD open trolley car has been equipped by the Memphis Street Railway, Memphis, Tenn., with a 1,000-gal. steel tank to carry water for small concreting jobs. The method formerly employed for this purpose was to carry on an automobile truck barrels filled with water. On account of the jolting of the truck much of the water was ordinarily lost before it reached the location of the job. This tank car is filled with water before leaving the carhouse and run to the various places where small jobs of concrete work are in process. Barrels standing on the ground at each stop are filled from the tank.



This Tank Car Has Been Found Superior to a Motor Truck for Carrying Water to Small Concrete Jobs

## Mica Washers Sized for Workmen's Convenience

IN OVERHAULING and reassembling the various types of resistance grids, a number of different sizes of mica washers are used. In the Kansas City Railways shops a method has been devised for storing this material which not only keeps the various sizes of washers sorted

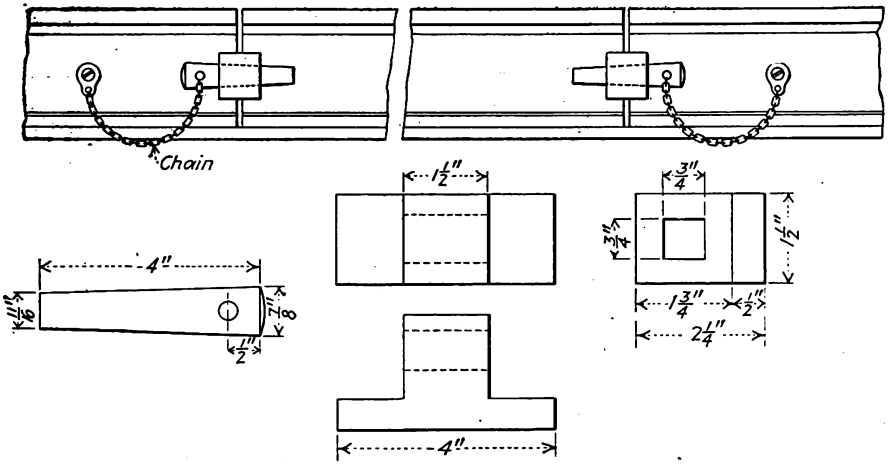


Mica Washers for Use in Assembling Resistance Grids Made Accessible by Stringing on Steel Rods Set in Holes in Assembly Bench in an orderly fashion, but also makes them quickly accessible for the workmen.

The method consists of stringing a supply of washers of each size on separate steel rods approximately a foot long, threaded on one end and having a nut run up 2 or 3 in. from that end of the rod. When any particular type of resistance grid is to be handled, the rods carrying the proper sizes of washers for use on that type of grid are selected from a storage bin which is convenient to the assembly bench, and these rods are then arranged in convenient fashion by dropping them into holes in the top of the bench as shown in the accompanying illustration. This makes all of the desired sizes of mica washers readily available and saves a considerable amount of hunting for materials. When the type of resistance box under repair is changed, it is a simple matter to make the necessary change in the type of washers for doing the work.

## Clamp for Movable Rails Over Wheel Pit

THE usual construction of pits for dropping out wheels from cars includes two short lengths of rail which are removable. A method for fastening these when in position by means of a clamp with a square cotter key is used in the shops of the Eighth Avenue Railroad, New York, N. Y. The clamp is made of steel with one side 4 in. long, which extends along the web of the rail. A projection from the center of this, 1½ in. square, passes through the web of the two rails at the points where they meet. The square part of the clamp which projects beyond the web of the rail has a ¾ in. square hole for the insertion of a square cotter key. The cotter key is fastened to the web of the rail by a light chain so that it will not be lost. To remove the section of the rail, a tap with a hammer on the end of the cotter key and on the clamp loosens this, and when removed the rail can be lifted out of position.

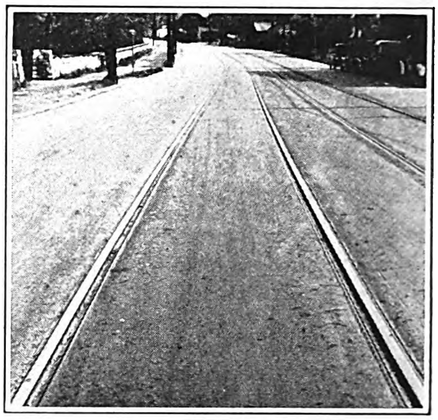


Convenient Fastening for Wheel Pit Rails

## Paving Guards Tried in Harrisburg

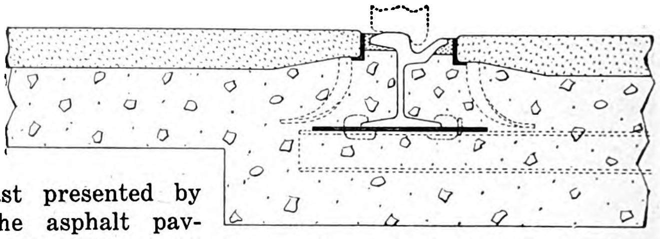
PAVING along the rail presents more of a problem than usual in Harrisburg, because the city, being the capital of the state of Pennsylvania, is largely residential in character, and smoothly paved streets are insisted upon. Asphalt has met with the greatest general favor as paving for the vehicular roadways, and a majority of the streets are now paved with this material. An attempt was made to pave the railway strip with asphalt, using the rails as an edging for the pavement. This proved to be unsatisfactory, however, because the movement of the rail and the consequent seepage of water between the rail and the asphalt destroyed the track foundation. Both brick liners and wood-block liners were tried. The contrast presented by the bricks and the asphalt paving detracted considerably from the neat appearance of the street, it was thought, and they were considered objectionable for that reason. Wood block liners have given from 10 to 12 years satisfactory service. After that the track usually begins to loosen up, causing displacement of the blocks.

Early in 1923 the first steel paving guards were installed. These were the Godwin type, which anchor deep in the paving base and provide a rigid edge for the pavement. Some difficulties were encountered at first in the installation of the guards, but these have now been pretty well overcome.



A Street in Harrisburg Where Steel Paving Guards Are Used Along the Rail

The cost of steel paving guards in Harrisburg is no greater than of wood-block liners. A 6-in. base of concrete is used below the rail, which is 7-in., 122-lb. grooved girder type. The concrete is brought up to within 3 in. of the finished surface and a coat of asphalt laid on top of that. More than 25,000 ft. of these guards are now in service along the tracks of the Harrisburg Railway, and they are being installed in connection with a number of new paving jobs.



Cross-section of Paving Construction Along the Rail

This type of construction proved satisfactory during the exceptionally wet winter just past, but is considered by the railway to be still in the experimental stage.

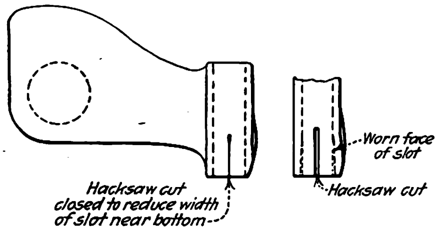
## Welding Armature End Laminations

ON THE General Electric type 69-C motors used by the New York Central Railroad some trouble was experienced with the chafing of armature coils at the ends, due to the vibration of the end laminations. The railroad company is now welding these together at the top by applying an oxy-acetylene flame. This method of welding the end laminations together has done away with the trouble from chafed and broken leads and also has proved of assistance in keeping the end laminations from spreading.

## Worn Brush-holders Reclaimed at Small Cost

WHEN brush-holders become worn they cause a number of operating difficulties, including brush chatter, poor contact between the brush and the holder, jamming of the brushes, etc. The Kansas City Railways Company has solved the problem of maintaining proper fit of the brushes in the holder by a simple method of reclamation, for which a number of hardened steel test blocks made up in the exact sizes of new carbon brushes of each type were prepared.

The wear on brush-holders occurs very largely near the lower end of the brush slot. To correct this a hacksaw cut is made at each side of the holder, and the holder is then clamped tightly in a vise so as to close up the slot. By inserting the standard steel block in the holder in place of a carbon brush before the holder is clamped, the lower faces of the slot are closed in to give exactly the proper size for a new brush.



Worn Brush-holder Reclaimed by Making Hacksaw Cut and Clamping Holder Against a Steel Block of Proper Size

Brush-holders reclaimed by this method have been found to operate with a high degree of satisfaction. A large number have been so reclaimed at very small cost, and they would otherwise have been relegated to the scrap heap.

# New Equipment Available

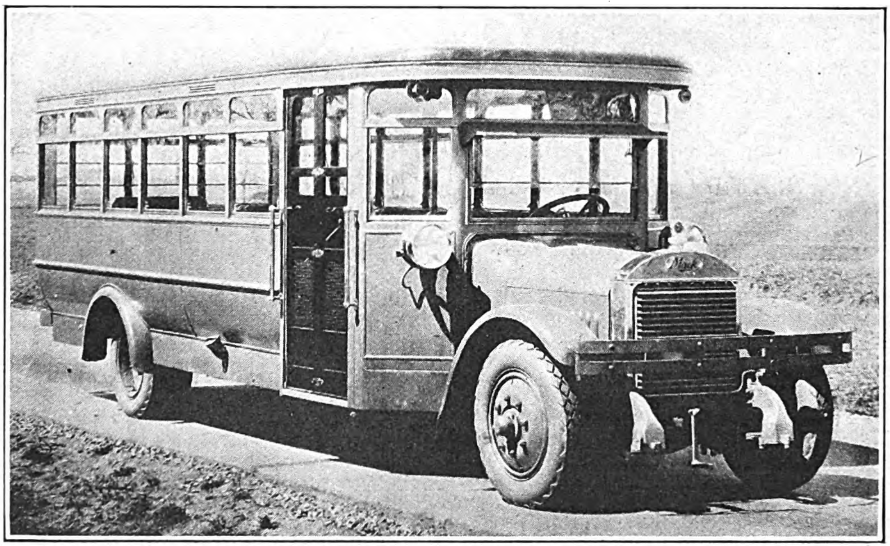
## New Punch and Shear

A COMBINED punch and shear that will accommodate plates, bars, angles, beams and channels is being marketed by Henry Pels & Company, Inc., New York, N. Y. The machine has a high and deep punch throat to accommodate wide flanged beams or wide plates. The punching head is of full floating type, and is adapted for a triple gag punching attachment. The head can also be fitted with a coping attachment, that will cope both the flanges or webs of beams or other sections.

The center portion of the machine has a diagonal slide with three openings, one for bars, one for angles and tees, and the third for beams or special shapes. The blades in the first two openings are arranged so that various sizes of material can be sheared without change. In the upper or third opening the blades for beams or special shapes are arranged so that they can be changed readily. The openings are provided with downholders, and the angle and tee shearing opening is equipped with beveling tables and stops which can be set for any angle from a square cut to a 45-deg. cut.

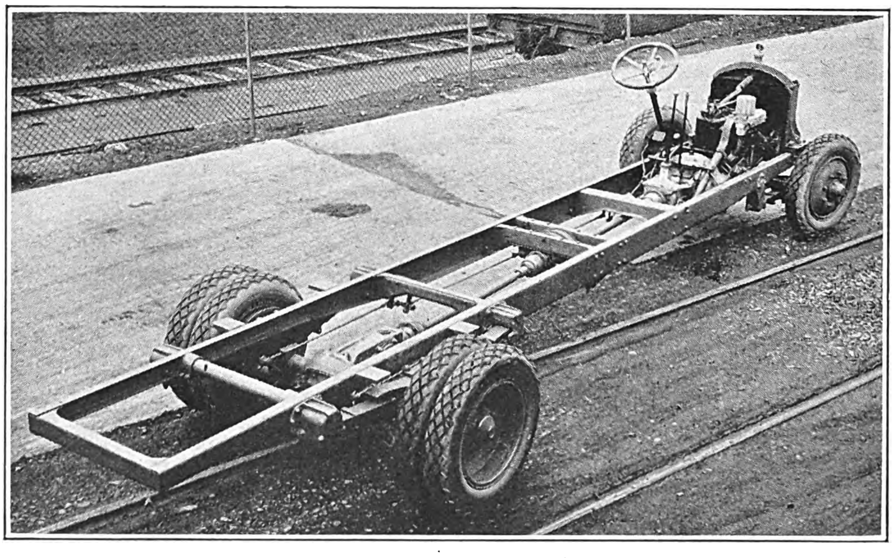
This combination machine is intended to take the place of separate units. The manufacturer states that any or all of the three operating parts of the machine can be used at one time without interfering with any other and but one power unit is required for operating all three parts.

## Mack Body on a Mack Chassis



Type of Body Now Being Mounted on Mack Bus Chassis

THE International Motor Company, New York City, is now equipping the latest type Mack bus chassis with a special bus body. This chassis, which is shown in the illustration below, is built for bus purposes only and is equipped with rubber shock insulators. The outstanding features of this chassis are a special bus motor, bus transmission, a rear axle specially designed for this service, and a special bus frame.



Special Bus Chassis Made by the Mack Company

# The News of the Industry

## Answer Filed

### Providence Company Denies Unreasonable Rates to Complaints of Cities on New Zone Limits

Following complaints by two cities and two towns against zone limits fixed under new rates put into effect by the United Electric Railways, Providence, R. I., the company filed an answer on June 17 in accordance with the order of the commission. The answer denied that zone limits and fare charges were unreasonable or discriminatory and pointed out that the deficit for 1923 was $69,501.

Only brief reference has been made before in the ELECTRIC RAILWAY JOURNAL to this fare change. The matter had its inception in a new fare tariff filed by the United Electric Railways on April 26 with the Public Utilities Commission to become effective May 27.

At the time of the filing of the tariff rates charged were: 6 cents per zone with reduced rate tokens sold nine for 50 cents. Tokens were good in each zone and carried the same privileges as a cash fare. The new tariff called for a raise in the cash rate from 6 cents to 8 cents per zone with tokens to be sold five for 35 cents.

Under the new tariff the first zone limits out of Providence on all lines except one were extended a quarter to one-third of a mile. Three three-zone lines were reduced to two zones. On all suburban lines having four or more zones the number of zones on the line was reduced by one. Extensions of the first zone limits were also made from the center of the cities of Pawtucket and Woonsocket. The average distance of the first zone limit from the center of the cities (track mileage) is 3 miles. Under the old zones the average distance (track mileage) was 2½ miles.

For a period of two years the company has been keeping its patrons in touch not only with its financial problems but many other problems, using the newspapers, pamphlets, dash signs, etc. Since October, 1923, the company has been devoting considerable advertising to its financial condition. After the filing of this new tariff, advertisements were carried in all the local newspapers two days each week, setting forth the reasons for the new tariff.

In Rhode Island the law requires a tariff to be filed at least thirty days before the date that it is scheduled to become effective. The commission has the power to suspend the tariff and conduct an investigation. Up to within a few days of the date the tariff was to become effective, no formal complaints had been made to the Public Utilities Commission.

On May 26 the city of Cranston, through its city solicitor, filed a protest in regard to the locations of zone limits. The town of North Providence took similar action on May 27. On May 26 the town of East Providence, through its town solicitor, filed a protest against the rate, claiming it to be unreasonable, further stating that the income of the company under the former tariff was sufficient. On May 26 the city of Providence, through its city solicitor, protested the locations of zone limits on a few lines.

Prior to the time the company filed this new tariff, the city of Providence had announced that it would not oppose the new fare rate if the first zone limit reached the city line on all routes. The new tariff placed the zone limits at the city line or beyond on all but four routes, and on the four routes in question the distance by air from the center of the city equaled the distance reached on other lines. All complaints, except East Providence, were against the location of zone limits, and not against the higher fare.

The Public Utilities Commission did not suspend the tariff and the rate become effective as scheduled on May 27.

## Fare Increase for Queens County Road

### New York Commission Holds Fare Advance Only Answer to Road with No Net Receipts Operating at a Five-Cent Fare and Faced with $250,000 Paving Expenses

THE New York Transit Commission on June 25 granted the New York & Queens County Railway, Long Island City, the right to raise its fare to 6 cents, announcing that for each $100,000 paving assessment charged against this company an additional cent was to be added to the carrying fee.

Commissioner Harkness, who wrote the opinion, referred to the matter as a "case of a railroad *in extremis*." As the commissioner sees it, a railroad with total gross receipts of about $700,000 and net receipts of less than nothing is expected to maintain a 5-cent fare, rehabilitate its track and roadbed and take on an additional expenditure of more than $250,000 for paving. He says it cannot be done and the only result of such a levy is that the receiver must either get additional revenue or the railroad go out of business. The answer is to be found in a readjustment of the rate of fare to tide this situation over.

Immediately Mayor Hylan issued a statement declaring the city would fight the increase, taking that fight "to the highest courts of the land." His plan, which was approved by the Board of Estimate, was for the city to take over the operation of these lines, which have been in the hands of a receiver, the profits to be divided between the city and the receiver. This had been urged before the Transit Commission by Corporation Counsel Vincent Victory.

It will be recalled that Mr. Justice Aspinall in the State Supreme Court stated that unless relief were granted on or before June 26 he would direct the receiver to discontinue operation of the railroad.

At the hearing before the commission the Corporation Counsel refused to go further than to say his instructions were to present the various franchise grants affecting this company. In consequence the commission accepted the city's position as not waiving such rights under those franchises as it possesses, but expressly neither favoring nor opposing the application on its merits. On the merits of the case no evidence was presented to controvert the alleged deplorable financial condition of the property. In fact, independent checks made under the direction of the commission confirmed those facts.

The Corporation Counsel, however, did criticise the course of the receiver in presenting an application for a fare increase in the first instance to the Board of Estimate and Apportionment, stating that in his view the proper procedure would have been for the receiver first to have made application to the commission and having exhausted his remedies there to have then applied to the local authorities. With this view Commissioner Harkness disagrees. He regards the course adopted by the receiver as the proper and logical one and that the procedure suggested by the Corporation Counsel would be directly counter to a proper conception of the principles of home rule. The city of New York, as the successor of certain towns and villages, is one party to these franchises and the railroad company is the other. Mr. Harkness says that the powers of the city are contractual, while those finally invoked by the applicant are the extraordinary police powers of the state, intended as a resource only in extreme cases. The commissioner contends that a fair, business-like adjustment of the situation as between the parties having been demonstrated to be impossible of accomplishment, a proper foundation is laid for the exercise of the state's police powers.

On the other hand the Corporation Counsel did suggest that the receiver should turn the property over to the city for municipal operation at a 5-cent fare, the city to divide any profits with him. Justice Aspinall refused to entertain this proposal, stating that it was unlawful as being without the city's powers. As for the commission, it cites a recent case arising out of the municipal operation of a line on Staten Island where the law department of the city, in defending a personal injury case involving loss of life, set up as a defense that the city was operating illegally and therefore was not answerable in damages.

As Commissioner Harkness sees it, however, the main difficulty in this case is the question of the power of the commission to act. By the amendments of 1923 to the Public Service Commission law the power of the commission in respect of rate cases is the same as it was prior to the enactment of the rate legislation of 1921. That throws things back on the Quimby case (Matter of Quimby vs. Public Service Commission, 223 N. Y., 244) and the cases following or distinguishing it.

### COMMISSION HAS POWER

The rule as laid down by the Court of Appeals in those cases, succinctly stated, is that the commission has power to act in the case of rates fixed by the Legislature and in the cases of franchises or consents given by the local authorities before 1875 and after 1907. Mr. Harkness says that the various grants and consents by the former towns and villages that affect the New York & Queens County Railway run back as far as 1873. He examined the fare provision in these franchises and consents, and in view of the various granting powers and the lapse of time the result is complete confusion when it is attempted to apply them in the light of the fact that the localities have changed from small scattered villages to an integral part of the city.

In general, so far as the fare provisions are concerned, the franchises fall into three classes: First, a group where there are either no fare limitations at all or the maximum fare is fixed at 10 cents; secondly, a group where there is no fare limitation in terms but reference is made in the grants to Chapter 252 of the Laws of 1884, and, third, a group where there is an explicit restriction to a 5-cent fare. In the last group Mr. Harkness found the greater part of two lines, the Corona line and the Flushing-Jamaica line.

With respect to the second group, he concluded that these franchises are subject to regulation. Chapter 252 of the Laws of 1884 provides for a 5-cent fare, but to the commissioner this is clearly a statutory fixation of a rate, and the fact that villages and towns in granting consents referred to it in the franchise documents does not operate to change its essential character.

From a study of the documents it seems to the commissioner that the confusion is legally relieved by an action taken by the Board of Estimate and Apportionment in 1913. Under date of Feb. 6, 1913, that body granted the railway a franchise for additional trackage on certain streets within the limits of the former villages of College Point and Flushing. This franchise contains the following clause:

> Thirteenth—The rate of fare for any passenger upon said railway shall not exceed five (5) cents, and the company shall not charge any passenger more than five (5) cents for one continuous ride from any point on said railway, or a line or branch operated in connection therewith, to any point thereof, or of any connecting line or branch thereof, within the limits of the city.

According to Mr. Harkness, the actual new grant made by the Board of Estimate covers only certain streets in College Point and Flushing, but the language quoted makes it clear that it was the intention to go beyond this and to compel the company to subject not merely the part covered by its application but its entire line to a 5-cent rate of fare, irrespective of the provisions in the old franchises granted by the towns and villages. Mr. Harkness says:

> There is a limitation of the rate of fare upon "said railway," but in addition and over and beyond that there is a limitation upon "the company" providing that it shall not charge more than 5 cents for a "continuous ride from any point on said railway, or a line or branch operated in connection therewith, to any point thereof, or to any connecting line or branch thereof, within the limits of the city." What is the legal effect of this provision? Under the old town grants, for example, the company was permitted to charge a 5-cent fare within the village of Flushing, a 5-cent fare within the village of Newtown, and so on. It seems to me to be clear that the Board of Estimate and Apportionment intended that the company should, and the company in fact and in law did, surrender its fare rights under the old grants and accepted in lieu thereof a flat 5-cent fare over the entire system.
>
> Legally, therefore, this agreement constituted a new fixation of fare rendering null and of no effect the old provisions in the franchises and consents granted by the villages. If the receiver should now attempt to charge a flat 5-cent fare within the limits of the village of Flushing in accordance with the old grant and an extra fare to points outside it, he would certainly be met by the city with the entirely valid claim that he was bound by the adjustment of 1913. If the company and its receiver are bound by that adjustment, it certainly should follow that the city as the other contracting party as well is bound.
>
> I decide as a matter of law that the rights of the city and the railroad, so far as the matter of the rate of fare is concerned, are fixed by the franchise agreement of 1913. As that agreement was made after the enactment of the Public Service Commission law in 1907, it follows that the rate of fare is subject to the jurisdiction of the commission.

The commissioner says that the merits of this case are clear, and in simple justice and fairness can lead to only one conclusion. The railroad has for years been losing heavily and there is an outstanding funded debt of about $4,000,000 and an unfunded debt of about $7,000,000. The testimony of the receiver indicates this general income situation (using the figures for the period from Jan. 18, 1923, the date of his appointment, to Jan. 31, 1924): Receipts, $708,733; disbursements, $714,722. In round numbers 13,000,000 passengers were carried during the period mentioned.

The item of disbursements does not include interest, on debt, funded or unfunded, except interest on some $200,000 of underlying bonds, the payment of which is necessary to prevent the disruption of the system. There is no provision for any reserves, nor for interest on taxes accrued prior to the receivership. It merely covers what may be termed bare bone operating costs.

According to Mr. Harkness, two main factors have operated to bring the situation to a crisis: (1) The physical condition of track and roadbed, and (2) the imposition of heavy paving charges by the city authorities. The receiver and his general manager testified that unless an additional $100,000 is expended on track and roadbed during the coming year the operation of the railroad will become dangerous. The commissioner says that in this they are borne out by the commission's engineers. The receiver also estimates an additional allowance for equipment maintenance of $8,000. An item of $34,000 is added for damage claims. Approximately $20,000 is estimated for additional wages to train crews. There is also a slight increase in track rentals due to the new connection with the rapid transit line at Junction Avenue. Although pointing out the necessity for adequate reserves and of expenditures for other purposes, the receiver confines himself, in his application, to the foregoing increases for bare costs for operating the railroad.

### PAVING CHARGE DISCUSSED

On these points the commissioner says:

> As against this the only savings indicated are possible ones through reductions in power costs and through a continuance of his efficient operation. These possible savings, however, will not offset the imperative items of increase mentioned above, nor would any added gross receipts that might be expected under a normal 5 per cent increase of traffic.
>
> The item of paving runs into larger figures. Under the railroad law street surface railroads are required to pay the cost of paving within their tracks and for two feet outside. This is a statutory provision passed in the days of the horse cars and was based upon the injury caused by the pounding of horses' hoofs and the cars on the then type of pavement. Little or no damage is now done to pavement by electric traction. Certainly nothing comparable to that done by heavy trucking. Nevertheless, the old provision remains, and in the case of a company like the New York & Queens County Railway results in literally back-breaking charges being levied against it. Not only is there involved the greatly increased cost of the paving itself due to better type than in the old days and the greater cost of labor and materials, but a rapidly expanding borough like that of Queens throws into a few years the transformation on a large scale of old country roads into modern, asphalted city streets. If it is a burden for a great city to bear its street improvement costs, what can be said of a broken down, impoverished railroad?

In conclusion the commissioner says:

> To take care of the $259,000 of paving charges listed by the Borough President would require a further increase of 2 or 3 cents, dependent upon what reduction in traffic might be caused by the increased fare. The imposition of such a paving charge against an impoverished railroad such as this and against its passengers is unreasonable. It is not a sufficient answer that it is required or sanctioned by law. Passing a statute does not of itself make its requirement reasonable and when it results in situations such as this it should properly be amended.
>
> It is an easy way for officials to place burdens upon railroad companies upon whose road and facilities the public depends. The unthinking may applaud not realizing that what injuriously affects a railroad likewise affects its patrons. A nickel must come in for every nickel that goes out. Thinking people appreciate that the imposition of such charges in situations like this means either increased fares, or if the fare be not increased then either badly depreciated service or abandonment. The truth of this may come through a fuller realization of the simple truth that railroad baiting, which in some quarters is such a favorite political pastime, must be paid for by the public either through suffering caused by depreciated or lost service or by paying increased fares.
>
> Therefore, the order in this case should provide that the rate of fare shall additionally be increased to correspond with any new paving charges if and when they may be levied against this company or its receiver. For the first $100,000, or any

part thereof, of paving charges levied the fare shall further be increased 1 cent. It is not practicable to split the cent in fare increases, and if the levy is under $100,000 it will be absorbed by a 1-cent increase all the more quickly. For additional levies the fare shall likewise be increased in the ratio of 1 cent additional fare for every $100,000 of paving charges. Such increased rate of fare is to be used only to pay such paving charges and is to continue only until they are satisfied.

The order should additionally provide that the 1 cent increased fare granted the receiver for rehabilitation and operating costs shall continue for one year unless otherwise hereafter ordered by the commission and that generally this proceeding be kept open so that the commission may promptly from time to time adopt such other order or orders herein as may be just and proper in the premises.

## Iowa City Will Have Railway Service

Iowa City's railway war has come to a close. The settlement was accomplished at a joint meeting of the City Councilmen, representatives of the Mississippi Valley Electric Company and of the William Horrabin Contracting Company.

The Council has agreed to absolve the railway from paying for paving between the rails. The cost of this had been estimated at $12,000. Railway officials declared that the burden of this sum if laid upon the railway would result in confiscation if higher fares were not permitted. The Council also promised to draft an ordinance covering this paving permit, and to continue it to include any future paving to be done on Church and Brown Streets.

The railway has promised to relay track which it had torn up and to resume railway service, for which it recently substituted transportation by bus.

The trouble started some weeks ago when the bus began operation. The railway maintained that the paving of Dodge and Church Streets this summer would lay an impossible burden on it if it was required to pave between rails on the long Dodge Street line. Citizens living in the north end objected to the bus service and taxpayers in general declined to assume the burden of additional taxes which would have been imposed upon them by the removal of the railway.

## Third Avenue Line, New York, Seeks Bus Rights

Leslie Sutherland, vice-president of the Third Avenue Railway System, New York City, revealed at the Public Service Commission's hearing on June 17 on the Gallo application for a certificate to run a bus line between the Yonkers city line and White Plains that it was part of his company's plan to run a line along the same route.

The railroad official asked Public Service Commissioner Oliver C. Semple, who conducted the hearing, to hold up decision on the Gallo Brothers' application until his company could make application on its own account. The commissioner informed Mr. Sutherland that application could not be made until the company had received the consent of all the communities along which the line would run. This has already been obtained by the North Street Transportation Company, owned by the Gallo Brothers.

Commissioner Semple allowed two weeks for the submission of briefs in the case, and his decision on the application will be made after these have been submitted.

## Poughkeepsie Company Petition Heard

A hearing was had before the Public Service Commission on June 18 on the application of the Poughkeepsie & Wappingers Falls Railway for permission to increase its cash fare within the city of Poughkeepsie and the village of Wappingers Falls and the fare zones between these places from 8 to 10 cents. The application was referred to in the ELECTRIC RAILWAY JOURNAL, issue of June 21. The company completed its case, except as to certain information on the additional retirement of property which was directed to be furnished, and the hearing was adjourned to July 2. Charles W. Gillespie, valuation engineer, testified for the company that the cost of reproducing the property new would be $1,900,000 and after deducting for depreciation would be $1,600,000. E. J. Cheney, another valuation engineer, testified the approximate reproduction cost would be $1,750,000. He was not allowed to testify as to the present day value because it appeared he had not made sufficient detailed examination.

## Extension and Rerouting Orders Issued in Chicago

The Illinois Commerce Commission handed down two orders during the week ended June 28 affecting the extensions and rerouting of cars of the Chicago Surface Lines. Both orders have been the result of agreement with the city officials following conferences looking toward the relief of traffic congestion in the loop and better transportation for certain sections of the city. The extensions ordered are:

A double-track extension in South Woodrow Wilson Road from West Seventy-first Street to West Seventy-fifth Street.

A double-track extension in West Seventy-first Street from South Woodrow Wilson Road to South California Avenue.

A double-track extension on West Fifty-ninth Street from South Kedzie Avenue to South Central Park Avenue.

A single-track extension on East 103d Street from the present terminus of the present track just west of the Illinois Central Railroad to Cottage Grove Avenue.

A double-track extension on North Kedzie Avenue from Foster Avenue to Bryn Mawr Avenue.

A double-track extension on Fullerton Avenue from a point near Lotus Avenue to North Central Avenue.

A double-track extension on Belmont Avenue from North Central Avenue to North Cicero Avenue.

A double-track extension on Lawrence Avenue from Broadway to a point near Sheridan Road.

An additional single-track extension with relocation and reconstruction of the present single track on Milwaukee Avenue from Carmen Avenue to the terminus of the existing track near the city limits.

The order which will bring about the rerouting of loop cars, on which both the city and the company have been earnestly working for months, must first go to the City Council to be formulated as an ordinance, and then construction work will proceed as rapidly as possible.

"We hope to have these improvements available to the riding public quickly," said Guy A. Richardson, vice-president of the Chicago Surface Lines, "but it probably will be near the middle of October before they will be completed. Construction work amounting to $100,000 is involved."

The rerouting order will also involve much work revising the schedules of all lines to bring them into complete harmony with the loop changes. Briefly, the advantages anticipated will be brought about through:

1. Clearing the car tracks of State, Clark and Wells Street for through traffic.
2. The elimination of twenty left turns and twelve right turns.
3. The looping of cars on Dearborn Street instead of State Street as at present.
4. The elimination of the stub terminal at Van Buren and Adams Streets.

## Ottawa Railway Starts Bus Line at Five-Cent Rate

The Ottawa Electric Railway, Ottawa, Canada, recently announced that it would start a bus line to run from the easterly limit of its service, a short distance from the city limits, out through the town of Eastview to Notre Dame Cemetery, charging a 5-cent cash fare with eight tickets for 25 cents. This area serves a town of some 5,000 people, suburban and rural.

Four bus lines had been running from the Post Office at Ottawa to the eastern end of the city, about 1 mile, then easterly on the Montreal Road through the town of Eastview for 1½ miles to Notre Dame Cemetery. Up to a short time ago, the fare was 10 cents or twelve tickets for $1. Upon entry of the railway bus the fare of the independents dropped to 5 cents each way.

## Kewanee Utilities Under New Management

A resumption of railway service in Kewanee, Ill., is expected following the sale of the Kewanee municipal electric plant to B. F. Lyons, vice-president and general manager of the Beloit Water, Gas & Electric Company. By a vote of 5,800 to 2,117, the citizens of Kewanee, Ill., on June 14 approved the sale. Mr. Lyons' improvement plans for the Kewanee properties include the consolidation of the municipal and privately owned electric plants, the extension and development of both the electric and gas service and equipment, the resumption of railway service, which was discontinued several months ago, and the rehabilitation of the interurban system connecting Galva and Kewanee.

The special election on the sale of the municipal electric plant was part of a plan prepared by Mr. Lyons to purchase along with it the privately owned electric and gas plants, the Kewanee street railway system and the interurban railway connecting Kewanee and Galva, Ill. The whole transaction will involve a sum upward of $2,000,000. Mr. Lyons will form the Kewanee Public Service Company and the Kewanee & Galva Interurban Company to operate the properties.

The so-called "Lyons plan" of consolidation and purchase has been before the voters of Kewanee for more than six months and the special election took place after an intense compaign both for and against the proposition.

## Bus Line in Rensselaer, Trackless Trolleys in Cohoes

The ordinance giving consent for the operation of a bus line in and along Washington Avenue in Rensselaer, N. Y., to the Capitol District Transportation Company, Inc., a subsidiary of the United Traction Company, was recently adopted by the Common Council of the city of Rensselaer. The bus line ordinance required that the company operate the line in compliance with all the requirements imposed by the provisions of the city charter. Consent is granted upon the express condition that the provisions of the public service commission law and transportion corporation law of the state are complied with. Transfers with the United Traction Company and a stipulation that the rate of fare to be charged shall always be the same as exacted by the United Traction Company are also provided.

In the city of Cohoes the Common Council has passed an ordinance granting permission to the same corporation, under practically the same conditions, to operate trackless trolleys over a route known as the "Belt Line" with some modifications for a period of ten years. In Cohoes four trackless trolleys will be operated at the start, in Rensselaer city two buses.

Both ordinances are expected to be signed shortly. The next step will be a formal application to the Public Service Commission for permission to operate subject to the terms of local franchise conditions. A public hearing must be held on this application.

## Reduction in Number of Women Conductors

Conductorettes are passing from the street cars of St. Louis, returning to the domestic pursuits they deserted during the war period to "woman" the platforms of the street cars of the city. Of the original squad of some fifty-two women fare collectors a band of ten remains. No others will be employed. The conductorettes did their work well, in the opinion of Superintendent of Transportation Butler, and it was only necessary to discharge one. The others, except the ten still on duty, have either married or found other employment. The women were subject to the same working conditions as the men. They are members of the carmen's union and receive equal pay with the men for the same work.

## Interurban to Run Buses

Officials of the Kansas City, Clay County & St. Joseph Railway have incorporated a new company to operate bus lines connecting Kansas City, Liberty and Excelsior Springs. The new concern will operate under the name of the Kansas City, Clay County & St. Joseph Auto Transit Company. The plan is to co-ordinate the bus line with the present railway service connecting these cities. Ultimately it is intended to extend the bus service to St. Joseph.

"Our purpose is to give the public the transportation it wants and the best of the kind," said Robert P. Woods, vice-president of the interurban, shortly after the organization. The other officials of the two companies are: Charles W. Ford, vice-president; W. S. Tuley, secretary-treasurer; Ross S. Mahan, general passenger agent; and James A. Weimer, superintendent of transportation.

Electric cars now leave the city every hour throughout the day. The present plan is to run buses every two hours. "As the bus business increases there will probably be decreased electric service," said Mr. Woods. "Circumstances will determine this."

## $5,000,000 Suburban Improvement Plan Approved

The Massachusetts Department of Public Utilities has issued an order approving the plan submitted by the trustees of the Boston Elevated Railway providing for the operation of rapid transit passenger trains on the Shawmut Branch section of the New York, New Haven & Hartford Railroad from Welles Avenue, Dorchester, to Mattapan, without interference with the transportation of freight over the railroad.

The plan is part of the establishment of a new rapid transit extension of the Elevated, which will carry the trains operating through the Harvard Square subway, over the tracks of the New Haven road in Dorchester and Milton. The entire project will cost approximately $5,000,000, it is understood.

Under the law, which was enacted last year, it is provided that the city of Boston can make no taking or purchase of land or property from the railroad companies until a satisfactory plan providing for the carrying of passengers, without interference with freight carrying, between Welles Avenue and Ashmont station, Milton, is submitted by the Elevated and approved by the commission.

## Power Shortage in Southern California Hits Railways

Large consumers of power in southern California, especially public utilities, including city railways and interurbans, have been ordered by the Railroad Commission to curtail power consumption 25 per cent. Among the railways hardest hit are the lines at Los Angeles. Service will be cut all along the line, but the owl service, in particular, will be reduced. The Southern California Edison Company sets forth in its order that violation of the order for the reduced use of power will result in power being switched off when the consumer exceeds his allowance.

During the past winter the rainfall in certain sections of California was the lightest in more than fifty years. The district particularly affected was the locality where hydro-electric power is produced and transmitted to southern California consumers.

Meanwhile the Southern California Edison Company has applied to the Railroad Commission for permission to increase its rates 20 per cent during the period of the power shortage, effective July 1. At a hearing before the commission in Los Angeles on June 17 protests were lodged by counsel representing practically all consumers of power furnished by the Edison company. The commission will continue the hearing on July 14.

The Edison Company states it has at an expense of $75,000 overhauled an old plant operated by steam and owned by Pacific Electric Railway in Los Angeles, which had not been in service for fifteen years. The Edison Company is also overhauling another plant of the Pacific Electric Lines that also had been idle for fifteen years. These emergency steps were taken to furnish further relief.

It is estimated that the additional operation cost to the Edison company on account of the existing power crisis will be from $3,000,000 to $5,000,000.

## Detroit Men Negotiate With Municipal Railway Officials

The twenty-seven members recently elected by the platform employees of the Detroit Department of Street Railways met on June 17 to organize and make definite plans in regard to matters to be taken up with the officials in rectifying the grievances of the motormen and conductors on the municipal lines. Donald B. Thurman was elected chairman of the committee. Raymond Jackson of the Clairmount East line was elected secretary.

Four sub-committees were chosen, each assigned a specific purpose. The committee on schedules is to work with the management in revising schedules. The pension committee will go into the question of obtaining pensions for retired car employees. The committee on by-laws will draw up a set of by-laws for the organization. The fourth sub-committee, on grievances, will hear the individual complaints of the employees.

The schedule committee, consisting of seven members, will meet with Louis Behnke of the schedule department of the D. S. R. every day until a system has been worked out for revising schedules to conform as much as possible to the demands of the men. A tentative schedule arrangement is to be submitted to the main committee at the next meeting. In the case of a number of complaints, the suggestions offered were ordered put into effect immediately, but action on the men's main grievance, that of schedule of runs, was deferred to permit the necessary study and co-operation between the men and the schedule department.

The demands to be submitted by the schedule committee will ask that 50 per cent of all runs in each carhouse be completed in consecutive hours; that all three swing runs. schedules which call for a man to divide his day's work into three separate shifts be abolished; that all two swing runs be completed within twelve consecutive hours, and that each platform man's schedule be so arranged that he draws pay for as near nine hours as possible.

No steps will be taken toward making a demand for increased wages until the schedules are complete. A request for one day vacation with pay out of every fifteen was presented to the management and this matter will be acted upon when the result of arranging schedules is known.

## South Side Celebrates

### Jacksonville Traction Extends Service to South Jacksonville Following Two Years' Efforts

South Jacksonville, Fla., celebrated the merriest day of the year on May 15, when floats, parades and pretty girls took part in the mammoth celebration in honor of the opening of the municipal railway system. The line, owned by the city of South Jacksonville and operated by the Jacksonville Traction Company, was placed in regular service to the public following the parade.. The celebration was pronounced by all a huge success from the moment that the twelve street cars and 100 automobiles and floats moved across the St. John's River bridge to the south side until the very last speaker was heard at the ceremonies.

The connecting link between Jacksonville and South Jacksonville has been talked about now for years. With the rapid expansion of the city and the intermittent bus service, the matter of municipal railway transportation was broached at meetings of the Chamber of Commerce and the City Council. The new construction was made possible when on April 10, 1923, the voters of South Jacksonville authorized the issuance of $100,000 of municipal bonds for a city-owned railway. This was an important step as it had been felt that the lack of adequate transportation facilities has been a detriment to the development and growth of South Jacksonville. Following the announcement of the intended construction of the line new homes rapidly grew up on vacant lots, and much purchasing of property on the south side followed.

Before the decision was made as to the construction of the lines careful investigation was made of the advantages of both a railway line and a bus line. Figures on the cost and maintenance of both types of transportation were prepared and turned over to the people at mass meetings. Compilation of the installation cost of each kind of service resulted in the election to decide whether the citizens wanted a $30,000 bus line or a $100,000 trolley system. Although only about half of the registered voters turned out to participate in the bond election, the bulk of the votes was registered for street cars. After the passage of the bond issue, city officials of South Jacksonville conferred with officials of Stone & Webster and the Jacksonville Traction Company and contracts with those concerns were finally signed for the construction of the line in South Jacksonville and its operation as part of the Jacksonville Traction Company.

The contract called for city supervision over all of the work. The operating contract with the Jacksonville Traction Company specifies a fifty-fifty split of earnings of the line between the city and the traction company. The cost of operation will be on a split car-mile basis, with the city paying for the mileage on the south side and the traction concern on the north side of the bridge. The south side city agreed to construct the track at an estimated cost of $7,000 and take the payment out in bridge tolls which were set by the county at $240 a month. This arrangement allows the cars to use the bridge for about two years and a half without remitting toll after constructing the tracks on the southern approach. At the end of this period the payment of toll will begin.

The fare charged is the same as on the Jacksonville lines, which since June 2 has been 10 cents cash and a 7-cent token rate. The $1.25 weekly pass is also in effect in Jacksonville.

## News Notes

**Men on Strike in Atlantic City.**—Trainmen of the Atlantic City & Shore Railroad, Atlantic City, N. J., went out on strike on June 21, crippling the service. The men are demanding an increase of 10 cents an hour and "the closed shop," which were both refused.

**Transit Commission Employees to Join City Staff.**—In the creation of the new city Board of Transportation, which starts operating on July 1, the New York Transit Commission recently stated that about 775 of its employees will be assigned to the new organization, while approximately 300 will remain on the staff of the Transit Commission. In the transfer the construction engineering staff, headed by Robert Ridgway, chief engineer, will virtually go intact to Commissioner John Delaney's Board of Transportation. Daniel L. Turner, consulting engineer, on the other hand, will remain with the Transit Commission. John H. Madden will be chief engineer of the Transit Commission. Frederick W. Lindars, chief accountant of the commission, who has been associated with Mr. Madden in the valuation bureau, will continue under the Transit Commission. James Blaine Walker, secretary of the Transit Commission, will continue in the same capacity.

**Bus Service Stopped.**—The Birmingham Electric Company, Birmingham, Ala., has discontinued the operation of its Milner Heights bus in connection with the Highland Avenue electric line. The bus was operated for some time from Arlington Avenue to Key Circle. J. S. Pevear, vice-president of the company, said the bus was started to see if there was a demand for the service.

**Stop-Over Privilege Denied.** — The Public Utilities Commission has dismissed the petition of citizens of South Portland, Maine, to force the Cumberland County Power & Light Company to establish stop-over privileges at Knightville, in the city of South Portland. The commission said that it was apparent that the purpose of the stop-over was to save the passenger payment of an extra fare which he would now be compelled to pay if he interrupted his passage at Knightville. The commission said that the company had to earn its operating and other fixed charges and that it had been operating at a deficit for the past few years. As a consequence stop-over privileges at South Portland, with the resulting decrease in income, would necessitate the amount of money so lost to the company to be made up from other sources, either by an increase in fare charges throughout the system or by a decrease of the expenditures for operation.

**Authorized to Cancel Commutation Rates.**—The Glendale & Montrose Railway has been authorized by the California Railroad Commission to cancel the thirty-ride commutation fare of $1 between Glendale and Eagle Rock, Los Angeles County.

**New Schedule of Rates.**—The Illinois Power & Light Corporation, which owns the railway system of Decatur, and recently purchased the Borden Motor Bus Line of that city, has filed a schedule of rates with the Illinois Commerce Commission. The schedule provides for a 1-cent charge for transfers from the buses to the cars, but when transfers are issued from the trolley cars to the buses, no charge is made. The company has placed five new Mack buses in operation, each seating twenty-five passengers. The fare on the buses will be 5 cents, the same as on the cars. The new combination of trolley and bus will be tried thoroughly and the proposed franchise for the railway will be held in abeyance until the new order of things is tested out. If there is no opposition after several months, it is expected that a new franchise will be adopted.

**Refuses to Interfere in Traction Suit.**—Judge Julius Mayer, in the Federal Court at New York, has refused to interfere in a suit now pending in the Supreme Court of New York County brought by one of the minority stockholders for an accounting and to enjoin the company from modifying the lease of the Forty-second Street Line. Job E. Hedges, receiver of the New York Railways, and the Guaranty Trust Company, as trustee, were represented before Judge Mayer and asked him to stay the Supreme Court action. The Judge advised the attorneys to confer with the Supreme Court, so that the court would not interfere with the work of the receiver in the reorganization of the property. A similar action is pending in the Federal Courts.

**Economies to Be Introduced.**—One-man car service on ten additional lines of the Springfield Street Railway, Springfield, Mass., has been announced as effective June 28. On several of the busier of these lines two-man service will obtain during the rush hours. A tariff providing for 10-cent fares with three tickets for 25 cents is being prepared for submission to the Public Utilities Commission. An increase of freight rates is also under consideration. All these departures are in the nature of efforts to cut costs to meet the wage increases and eight-hour day recently awarded by the arbitration board.

**Interurban Increase Allowed.**—The Maine Public Utilities Commission has authorized the Androscoggin Company, which operates between Portland and Lewiston, Me., to increase its through fare between Lewiston and Portland from 93 cents to $1. This change will necessitate a readjustment of intermediate fares, making slight advances and reductions for the intermediate zone sides. In its statement the commission said that the situation is the outcome of the extended use of automobiles.

# Foreign News

## Another London Strike Collapses

The strike of shopmen and others employed on the London underground electric railways collapsed on June 13 and the following day the full train services were resumed.

The strike was called on June 5 and included the shopmen employed by the underground group of companies and by the Great Western Railway. There had been very little notice of it, so that it came on the public as a surprise. Had it been confined to the shopmen the public would have been little inconvenienced, unless indeed the strike proved of long duration. Unfortunately, however, the strikers succeeded in getting a large proportion of the men employed in the Chelsea power station, and later in the Shepherd's Bush power station to join them. Many of the uniformed staff also joined. The result was that some sections of the underground railways were shut down and only a limited train service could be run on the other sections. Other consequences were the closing of numerous stations and great trouble to the masses of people who use the railways daily to get to and from their work.

Tramcars and buses were taxed far beyond their capacity. The Great Western Railway (steam) was little affected.

The strike was quite an unofficial affair. The executive of the leading railway trade union, the National Union of Railway men, repudiated it and made efforts to get the strikers to resume work. The latter appointed a strike committee and defied the union. No negotiations for a settlement could at first go on, as neither the railway companies nor the N. U. R. would recognize the irresponsible leaders of the strike.

The demands put forward by the insurgents were 10s. a week increase of wages, with an immediate minimum of £3 a week; the remaining 16s. 6d. of the war bonus to be merged in the basic wage; a week's holiday with pay each year; a guaranteed day and a guaranteed week.

The position of the N. U. R. was emphasized by its secretary, C. T. Cramp, who issued on June 11 a statement taking up the challenge given by the revoting members of the union. The substance was that the union would fight the unofficial strike committee, realizing that the union's existence depended on the victory of constitutional methods in collective bargaining. Mr. Cramp said that this was a fight between order and mob law and was only one manifestation of an underground movement which had been going on for some time. The organized labor movement should realize that attempts to placate or temporize with the forces of anarchy must lead to worse disasters. The strikers should at once go back to work and understand that they were being used as tools in the hands of unscrupulous men.

This outspoken denunciation of Communistic influences was accompanied on the same day by an ultimatum to the strikers from the London underground railway companies, warning those who were on strike that unless they reported for their regular hours of duty not later than June 13 it would be assumed that they had left the railway service, and steps would be taken against them for their strike action without proper notice. The Great Western Railway on the following day posted a similar notice. Crushed thus between their trade union and the railway companies, the devotees of the "unofficial" strike trooped back to work.

Before the strike ended four craft trade unions which had officially put forward demands of their own for increased wages had threatened to call out their men and so to paralyze the power stations, but when they saw how matters were moving in connection with the "unofficial" strike they promptly capitulated.

## Underground Line Proposed Along the Seine

Among the various projects under consideration for the extension of the Metropolitan Underground Electric Railway in Paris is one which will encircle the center of the right bank of the Seine—the heart of Paris—where the traffic has become so very intense that the service of today is entirely inadequate. The construction proposed is by the cut-and-cover method, rather than the deep tube, the street or roadway being sustained by steel pillars sustained by concrete foundations. It is believed that the new line can be built in small sections opened without interruption to street traffic save between the hours of midnight and 7 a.m. The chief difficulties to be encountered will be the rearrangements of water and gas mains, electric light and power and telephone and telegraph cables. These are particularly encumbering in this district, which follows closely the route of the grand boulevards. As a rider to the proposition it is stated that "the practice so common in the United States will be followed by placing all such in a separate tunnel."

## Paris Metropolitan Gross Up 4 per Cent

Net profits of the Paris Metropolitan Underground railway system for 1923 were 12,176,498 francs, of which 548,819 francs was carried to the reserve fund and 8,785,725 francs to dividend account, the balance being distributed by the agreement with the city of Paris.

There were commercially exploited 91.96 km. of line, as compared with 84.4 km. at the beginning of the year. Trains increased from 197 per day in 1922 to 208 per day in 1923, while car-kilometers increased from 80.864.688 in 1922 to 83,440,441 last year.

Electrical power, which because of the fall in the price of coal in 1922 was but 31,600,000 francs, amounted in 1923 to 41,300,000 francs. A new contract made recently should considerably diminish this charge the present year. Other operating expenses varied but little, being 124,183,713 francs in 1923 as compared with 108,245,764 francs the previous year.

Operating receipts were 164,135,236 francs, compared with 157,345,964 francs in 1922.

There remain to be constructed 39 km. of line already planned. During the past year various short connecting links have been opened. These Metropolitan lines are not to be confounded with the Nord-Sud trunk running from the northern to the southern fortifications which are a distinct company though operated in unison under the Transports en Commun, which holds itself responsible for the financing and construction of new lines or additions.

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**The Paris-Orleans Makes Headway in Electrification.**—After considerable difficulty in getting its electrification projects under way the Paris-Orleans Railway, by means of a governmental decree, has been able to surmount many of the material handicaps referring to expropriation and permission to run its transmission lines. The work of equipping and transformation of the substations of the Paris-Orleans and Bretigny-Dourdan lines is at last being undertaken. This is the first and most important project for giving suburban Paris an electrified interurban service.

**Loss on London Tramways.**—The balance sheet of the London County Council tramways for the year ended March 31, 1924, indicated a loss of £160,000 instead of the anticipated surplus of £78,000, it was intimated at a recent meeting of the Council. The recent tramway strike occurred during the financial year, being settled just as it closed. The deficit is to be met out of balances brought forward. For the current financial year a deficiency of £316,000 is anticipated, this including £164,000 for increased wages obtained as the result of the strike.

**Glasgow Buys British Trackwork.**—Glasgow Town Council on May 15 rejected the lowest tender for tramway special work, submitted by the United States Steel Products Company. The bid was £6,398. The lowest British offer was that of Edgar Allen & Company, Sheffield. It was £6,908. It was agreed to accept the tender of the latter, by thirty-nine votes to fourteen. On several previous occasions the Council has accepted the offers of the United States Steel Products Company because they were the lowest.

**Paris Public Service Transportation Profits.**—The Paris Transports en Commun announce a net profit on operations for 1923 of 6,504,715 francs, compared with 5,976,612 francs for 1922. A portion of this profit goes to the Department of the Seine, leaving a final sum to be distributed of 6,016,100 francs, against 5,688,188 francs in 1922. Dividends which will be proposed for distribution at the general meeting to be held on June 10 will be 30 francs, the 500-franc share plus a bonus of 14.25 francs.

# Financial and Corporate

## Small Balance Reported in Indianapolis

### Company Operating Local Lines There Convinces Commission of Inadequacy of Five-Cent Fare

The annual report of the Indianapolis Street Railway, Indianapolis, Ind., for the year ended Dec. 31, 1923, was presented at the annual meeting of the stockholders held on June 11. The balance for the year after allowing for all deductions was $4,116. The directors of the company, through Robert I. Todd, president, review the affairs of the company for the year at considerable length, particularly the improvements to track and roadway. They also discussed the subjects of fares, dividends, power, freight terminals and bus competition.

It is pointed out that the inadequacy of a 5-cent fare to provide funds for many needed improvements was again brought to the attention of public officials and that on Jan. 21, 1924, and Jan. 22, 1924, the matter was informally discussed before the Board of Public Works and the Indianapolis City Council, respectively. On March 18, 1924, the company presented its petition for higher fares to the Public Service Commission and on April 18 the commission issued an order granting a cash fare of 7 cents, with the privilege of purchasing four tickets for 25 cents, and a charge of 1 cent for each transfer instead of 2 cents as formerly. Double transfers over certain routes at 1 cent each were also authorized. The fare of 10 cents on owl cars was continued, all these changes to go into effect on May 20. The revenue from increased fares over and above the passenger receipts for the corresponding month of 1923 are to be set aside each month in a special depreciation fund and used solely for repairs to tracks, cars and the improvement of the service generally.

INCOME ACCOUNT OF THE INDIANAPOLIS STREET RAILWAY FOR YEAR ENDED DEC. 31, 1923

| | |
|---|---|
| Gross Earnings from Operation: | |
| Passenger receipts—city lines | $4,602,549 |
| Transfer receipts—city lines | 379,871 |
| Track rentals interurban passenger cars | 158,432 |
| Track rentals interurban freight cars | 49,417 |
| Chartered cars | 847 |
| Advertising | 31,467 |
| Dog permits, etc | 1,865 |
| Rent of land and buildings, miscellaneous | 25,600 |
| Rent of terminal building and stations | 253,420 |
| Sale of power | 4,879 |
| Rent of equipment | 6,420 |
| Miscellaneous income | 29 |
| Interest, discount, etc | 12,335 |
| Total gross earnings | $5,527,131 |
| Operating expenses: | |
| Maintenance of way and structures | $643,950 |
| Maintenance of equipment | 516,798 |
| Operation of power plant | 850,844 |
| Operation of cars | 1,594,879 |
| General expense | 427,889 |
| Total operating expense | $4,034,360 |
| Total net earnings | $1,492,771 |
| Less taxes | 419,868 |
| Total net earnings, less taxes | $1,072,903 |
| Deductions:—Bond Interest | |
| Interest on $4,000,000 Citizens Street R.R. 5's | $200,000 |
| Interest on $4,987,000 Indianapolis St. Ry. 4's | 197,497 |
| Interest on $3,833,000 Indianapolis Trac. & Term. Co.'s 5's | 188,479 |
| Interest on $200,000 Broad Ripple Traction Co.'s 5's | 10,000 |
| Interest on trust equipment notes | 2,742 |
| Interest on Indianapolis Car Equipment Co. pref. stock | 7,850 |
| Interest on notes, etc | 32,219 |
| Total deductions | $638,787 |
| Surplus (exclusive of accrued depreciation) | $434,116 |
| Deduction from Surplus: | |
| Indianapolis Street Railway Company sinking fund | $70,000 |
| Indianapolis Traction & Terminal Co. sinking fund | 60,000 |
| Dividends due on $5,000,000 preferred stock | 300,000 |
| Total deduction | $430,000 |
| Balance | $4,116 |

Four quarterly back dividends of 1½ per cent on the preferred stock of the company were paid during 1923. Quarterly dividends were also paid on March 1 and June 1, 1924. The dividends on this preferred stock are cumulative and are still eighteen months in arrears.

The contemplated development and enlargement of the West Tenth Street power plant of the Terre Haute, Indianapolis & Eastern Traction Company has been delayed by injunction proceedings. This seriously affects the Indianapolis Street Railway and prevents it from purchasing all its power from the Terre Haute, Indianapolis & Eastern Traction Company, so that it may shut down its West Washington Street power plant, where the cost of generating power is excessive. The case is now before the Supreme Court of Indiana and it is hoped that a favorable decision will be reached in the near future.

The recent completion of the largest electric railway freight terminals in the country on a tract of 11 acres at Kentucky Avenue and Morris Street by the Terminal Realty Corporation, the common stock of which is owned jointly by the four interurban companies entering Indianapolis, entirely relieves the Indianapolis Street Railway from the past obligation of providing freight terminals. The property heretofore used for freight business will be utilized for other purposes.

Ten Peter Witt type cars with center doors have recently been purchased and will be placed in service within the next few weeks.

In conclusion it is said that the earnings of the company from Jan. 1 to May 20, 1924, show a decrease of nearly 3 per cent, but it is hoped the increased fares which went into effect on May 21, 1924, will result in considerably increased earnings and thus enable the company to make many necessary improvements.

## $1,581,000 Refunding Issue Authorized

The Boston Elevated Railway, Boston, Mass., has been authorized by the Department of Public Utilities to issue coupons or registered bonds for $1,581,000, payable in thirty years and to bear interest at not more than 6 per cent. The proceeds of the issue are to be used in refunding a like amount of bonds of the West End Street Railway which will become due on Aug. 1, 1924.

These bonds of the West End Street Railway were approved by the Public Service Commission in 1918, but under the acts of the Legislature of 1911 the merger of the West End with the Boston Elevated was authorized. This merger has since taken place and the Elevated assumes the indebtedness of the West End. If any surplus is obtained through premiums in the sale of the new bonds they will be applied to the cost of permanent additions or improvements in the Elevated property, as approved by the Department of Public Utilities.

## $9,000,000 of Detroit United Bonds Offered

Dillon, Read & Company, New York, offered for subscription on June 23 $9,000,000 of first mortgage and collateral trust sinking fund five-year 6 per cent bonds of the Detroit United Railway. The offering price was 99 and interest, to yield more than 6.20 per cent. The total authorized issue is $10,000,000.

The bonds are being issued to provide for the redemption of the company's twenty-year first mortgage collateral 8 per cent sinking fund gold bonds and divisional bonds now outstnding on the property directly owned, to acquire $3,000,000 first consolidated 4½ per cent bonds or underlying bonds on the city lines in anticipation of the payments by the city of Detroit, for capital requirements, and for other corporate purposes.

The bonds will be secured by direct first mortgage lien on 226 miles of electric railroad, including the lines from Detroit to Flint and from Detroit to Pontiac, and will be further secured by the pledge of the entire stocks of subsidiary companies owning 357 additional miles, subject to $9,900,000 divisional bonds which cannot be increased in amount. The bankers explain that the Michigan Public Utilities Commission has placed a present value of $16,064,473 for rate-making purposes on the property on which these bonds will be a direct first mortgage and a value of $17,048,546 on the property by which the bonds will be collaterally secured.

The mortgage securing the bonds provides for an annual sinking fund of $1,500,000 for the first three years of the life of the issue and an annual sinking fund of $500,000 for the remaining two years, payable semi-annually, to be applied to the purchase of bonds of this issue if obtainable at or below the call price, or if not so obtainable, to the redemption of bonds at the call price. To meet in part these sinking fund payments the company will be required to deposit with the trustee $3,000,000 Detroit United Railway first consolidated 4½ per cent bonds due 1932 or underlying bonds on the city lines.

These bonds are made deliverable $500,000 semi-annually at their face value to the city of Detroit, against which the city has agreed under the contract of March 10, 1922, to pay $500,000 cash semi-annually toward the deferred purchase price of the lines within the city of Detroit which were taken over by the city in 1922. These payments by the city of Detroit assure the provision of more than half of the total cash requirements for the sinking fund.

It is calculated that this issue of bonds having a direct first mortgage lien on property now valued at $16,064,473, in addition to the property on which they will be collaterally secured, will be reduced by the sinking fund to $3,500,000 by maturity.

The company has called all twenty-year first mortgage 8 per cent sinking fund gold bonds for redemption on July 25 at 107½ and accrued interest.

## Further Abandonments Sought in New Jersey

The Pennsylvania & New Jersey Railway has petitioned the Public Service Commission of Pennsylvania for authority to abandon service from Trenton, N. J., to Newtown, Pa., and from Trenton, N. J., to Lambertville, N. J. Neither line, the company insists, is able to meet operating expenses and provide interest on the bonded debt. The company also asks permission to suspend the Mill Street line of the Morrisville-Trenton division, although it asks for the privilege of continuing service between Trenton and Morrisville, with the Mill Street line excluded. There will be a public hearing on the application on June 27.

The company is anxious to establish a bus line between Washington's Crossing and Trenton via Yardley and Morrisville, but says that passenger traffic is so small on the Newtown line it cannot justify service by railway or bus. Last October the corporation abandoned its Bristol-Doylestown line. A bus line is now being operated between these towns by an independent concern.

## $2,886,619 Net for West Penn Railways

Separate statements of the earnings of subsidiaries are contained in the report of the West Penn Company for the year ended Dec. 31, 1923. These subsidiaries are the West Penn Railways, the West Penn Power Company and the Monongahela-West Penn Public Service Company. The consolidated income account shows gross earnings of $23,230,740 compared with $17,323,089 for the previous year, but the report for 1922 included the returns of the Monongahela-West Penn Public Service Company only from July 1, 1922. The net income for the year ended Dec. 31, 1923, was $2,972,957 compared with $1,743,086 for the previous year.

The gross earnings of the West Penn Railways and subsidiaries for the year were $18,059,445 and the net income available for dividends on the capital stock of the West Penn Railways was $2,886,619. The consolidated income account of the railway is shown in the accompanying statement. During the year twenty-five new cars were acquired for the railway properties and placed in operation—six interurban cars with a seating capacity of seventy-four each for the lines in Pennsylvania, two interurban cars having a seating capacity of seventy-two each for the Wheeling district, and seventeen city-type, one-man, steel cars for the lines of the Monongahela-West Penn Public Service Company. The plant, property and investment account of the West Penn Company and subsidiaries shows a net increase during the year of $17,076,464.

CONSOLIDATED INCOME ACCOUNT OF WEST PENN RAILWAYS AND SUBSIDIARIES
YEAR ENDED DEC. 31, 1923

| | | | |
|---|---|---|---|
| Gross operating earnings | | | $18,059,445 |
| Operating expenses and maintenance (including $1,409,717.49 for depreciation) | | $11,568,438 | |
| Taxes (including federal) | | 1,053,262 | |
| | | | 12,621,700 |
| | | | 5,437,745 |
| Miscellaneous income | | | 1,052,438 |
| | | | 6,490,183 |
| Interest on funded debt | $2,809,076 | | |
| Interest on floating debt | 203,420 | | |
| Amortization of discount | 148,371 | | |
| | 3,160,867 | | |
| Less interest charged to improvement accounts | 353,932 | | |
| | | 2,806,935 | |
| Dividend accrued on preferred stock of West Penn Power Company in possession of public | | 517,746 | |
| Income applicable to common stock of West Penn Power Company owned by the West Penn Company | | 278,882 | |
| | | | 3,603,564 |
| Net income available for dividends on capital stock of West Penn Railways | | | $2,886,619 |
| Miles of railway owned (single track mileage) | | 519.50 | 520.47 |
| Cars: passenger and express | | 429 | 456 |
| Cars: service and miscellaneous | | 84 | 92 |
| Car-miles (passenger and express) | | †14,339,120 | †13,858,245 |
| Car-hours (passenger and express) | | †1,380,651 | †1,322,486 |

† Total for twelve months.

## Preferred Stock of Holding Company to Be Offered

A banking syndicate including Pynchon & Company and West & Company, New York, is offering an issue of 10,000 shares of participating and non-callable cumulative Class A preferred stock of the General Gas & Electric Corporation. The price of the stock is $104 per share and accrued dividend to yield about 7.70 per cent.

The General Gas & Electric Company controls through stock ownership eleven public utility companies, which, in turn, control thirty-five additional public utility companies, serving communities in the Eastern section of the company with electric light and power, gas and interurban and city railway service. The properties include the Metropolitan Edison Company, Pennsylvania Edison Company, New Jersey Power & Light Company, Binghamton Light, Heat & Power Company and Reading Transit & Light Company.

## Conspectus of Indexes for June, 1924

Compiled for Publication in this Paper by
**Albert S. Richey**
Electric Railway Engineer
Worcester, Mass.

| | Latest | Month Ago | Year Ago | Since War | |
|---|---|---|---|---|---|
| | | | | High | Low |
| **Street Railway Fares*** 1913 = 4.84 | June 1924 **6.97** | May 1924 **6.95** | June 1923 **6.92** | May 1921 **7.24** | May 1923 **6.88** |
| **Street Railway Materials*** 1913 = 100 | May 1924 **161** | Apr. 1924 **163** | May 1923 **173** | Sept. 1920 **247** | Sept. 1921 **156** |
| **Street Railway Wages*** 1913 = 100 | June 1924 **220** | May 1924 **219** | June 1923 **210** | Sept. 1920 **232** | Apr. 1923 **207** |
| Steel—Unfilled Orders (Million Tons) 1913 = 5.91 | May 31 1924 **3.63** | Apr. 30 1924 **4.21** | May 31 1923 **6.98** | July 31 1920 **11.12** | May 31 1924 **3.63** |
| **U.S. Bank Clearings Outside N. Y. City (Billions)** | May 1924 **15.83** | Apr. 1924 **15.96** | May 1923 **16.36** | Mar. 1920 **18.54** | Feb. 1922 **10.65** |
| **Business Failures** | May 1924 | Apr. 1924 | May 1923 | Jan. 1924 | Sept. 1923 |
| **Number** | **1,744** | **1,730** | **1,470** | **2,258** | **1,280** |
| **Liabilities (millions)** | **70.04** | **72.97** | **30.91** | **109.1** | **27.50** |

| | Latest | Month Ago | Year Ago | Since War | |
|---|---|---|---|---|---|
| | | | | High | Low |
| **Eng. News-Record Construction costs** 1913 = 100 | June 1924 **216.8** | May 1924 **222.4** | June 1923 **220.7** | June 1920 **273.8** | Mar. 1922 **162.0** |
| **U.S. Bur. Lab. Stat.** Wholesale Commodities 1913 = 100 | May 1924 **147** | Apr. 1924 **148** | May 1923 **156** | May 1920 **247** | Jan. 1922 **138** |
| **Bradstreet's** Wholesale Commodities 1913=9.21 | June 1 1924 **12.29** | May 1 1924 **12.56** | June 1 1923 **13.38** | Feb. 1 1920 **20.87** | June 1 19.1 **10.62** |
| Dun's Wholesale Commodities 1913 = 120.9 | June 1 1924 **183.8** | May 1 1924 **184.7** | June 1 1923 **191.4** | May 1 1920 **263.3** | July 1 1921 **159.8** |
| **U.S. Bur. Lab. Stat. Retail food** 1913 = 100 | May 1924 **141** | Apr. 1924 **141** | May 1923 **143** | June 1920 **219** | Mar. 1922 **139** |
| **Nat. Ind. Conf. Bd. Cost of living** 1914 = 100 | May 1924 **161.4** | Apr. 1924 **161.8** | May 1923 **160.3** | July 1920 **204.5** | Aug. 1922 **154.5** |

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population.

Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen and conductors on 105 street and interurban railways in the United States, operating more than 100 passenger cars each, and weighted according to number of cars.

## Car Line in Brunswick, Ga., to Be Dismantled

The required number of votes were not polled in Brunswick, Ga., at the recent special election and as a result the Brunswick & Interurban Railway has discontinued operations. If the vote had carried it would have authorized the city to enter into a contract with the Brunswick & Interurban Railway for a lease of the property under which the city was to take over and operate the line for a period of years with the privilege of buying the railway. It is said that the owners will proceed as soon as possible to dismantle and junk the property.

The present railway has been in operation since 1909, and for the first few years the line was operated at a good profit. With the growing use of the auto receipts began to decrease, but picked up again during the war, when the company again made money. A few years ago a receiver was appointed and the line was about to be discontinued, but the Young Men's Club jumped into the fight and through its efforts the present company was organized and has since operated the line. It has been a losing proposition during the entire time that the present company has operated it.

## Fifth Avenue Bus Property Sale Reported

Control of the Fifth Avenue Bus Securities Corporation and the New York Transportation Company, New York, operating the Fifth Avenue buses, will pass to the Chicago Motor Coach Company.

Details of the plan will be submitted to stockholders of the Fifth Avenue company at once. They include an exchange of present securities of the corporation for those of the Omnibus Company of America, a new company to be organized, or as an alternative a cash offer for the New York stock.

It is announced that the Interborough Rapid Transit Company will relinquish its holdings in the bus line. The company originally deposited 51 per cent of the voting stock with the company and this was resold to the public, although the Interborough retained a voting control. In the new transfer the Interborough will lose this voting control and withdraw entirely from operation of the buses.

## Suburban Lines at Chicago to Vote to Consolidate

Consolidation of two traction lines under the direction of Samuel Insull of the Chicago Rapid Transit lines will be voted upon by stockholders of the two properties on Aug. 19.

The lines involved in the projected reorganization are the Chicago, North Shore & Milwaukee and the Chicago, North Shore & Northern. The latter was formed to construct the new Niles Center extension of the Chicago Rapid Transit Company, a line ultimately destined for Waukegan, along the right-of-way of the high-tension electric line north from Dempster Street at Niles Center.

The consolidation, officials said, does not mean that the Dempster Street-Waukegan extension will be constructed in the immediate future, but that preparations are being made for such an extension within a period ranging from two years to five years distant. No immediate extension of the lines from Dempster Street is contemplated.

The Chicago, North Shore & Northern, which secured the right of way both for the Howard Street-Dempster Street and the Dempster Street-Waukegan lines, is headed by Samuel Insull, and the majority stockholders are stockholders of the Chicago, North Shore & Milwaukee, so that the consolidation means merely a fusion of two interests under one company. Under the consolidation the Milwaukee line will have a $4,000,000 first mortgage bond issue outstanding. The authorized bond issue is $10,000,000.

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**Railway Service Abandoned.** — Railway service has been abandoned by the Wisconsin Power & Light Company, formerly known as the Eastern Wisconsin Electric Company, on its 11-mile line connecting the cities of Oshkosh and Omro. Just recently this company received permission from Common Council to install and operate bus service between these two cities in addition to its interurban service.

**One-Year Interurban Issue Offered.** —The National City Company, New York, offered for subscription on June 19 $3,500,000 of Chicago, North Shore & Milwaukee Railroad one-year 6 per cent gold notes dated June 16, 1924, and due June 15, 1925. The notes were sold privately at 99¾. They have all been subscribed.

**Collateral Notes for Indiana Line.**— The Union Traction Company of Indiana, Anderson, Ind., has filed a petition with the Indiana Public Service Commission asking authority to issue $222,000 of collateral notes. This money is to be used for miscellaneous betterments.

**$4,770,000 Paid on Detroit Purchase.** —Approximately 25 per cent of the Detroit street railway purchase price has been paid to the Detroit United Railway according to announcement by I. N. Merritt, accountant for the municipal railway. The semi-annual payment of $500,000 and interest on the purchase were deposited on June 2. The sum of $4,770,000 has been paid by the Municipal Street Railway Department on the original price of $19,850,000 executed two years ago and interest payments totaling $1,979,288. Principal in the amount of $15,080,000 remains to be paid.

**Receiver Takes Charge.** — Dexter S. Kimball, dean of the college of engineering, Cornell University, was appointed receiver of the Ithaca Traction Company, Ithaca, N. Y., on June 23 in compliance with an order by Supreme Court Justice Leon Rhodes of Binghamton, N. Y.

**Syndicate Seeks Columbus Stock.**— Common stockholders of the Columbus, Railway, Power & Light Company, Columbus, Ohio, have received a circular from Fuller & Rounsevel, Columbus, offering $115 a share and accrued dividend for a minimum of 31,000 shares and a maximum of 46,000 shares out of approximately 60,000 shares outstanding. It is understood the stock is sought for the Continental Gas & Electric Corporation, which recently purchased 75 per cent of the common stock of the Kansas City Power & Light Company.

**$947,000 Value Fixed for Jackson Plant.**—Preliminary to the negotiations between the Electric Bond & Share Company and the Jackson Railway & Light Company, Jackson, Tenn., for the purchase of the Jackson plant the State Utilities Commission has fixed the value of the property on which a fair and reasonable return may be made at $947,000. The company charges a 5-cent fare. A rate base has never before been fixed for it by public authority.

**Railway Included in Electric Merger.** — The recent incorporation of the Bangor Hydro-Electric Company means an immense hydro-electric merger in eastern Maine. The company plans to acquire, with the consent of the State Public Utilities Commission, the Bangor Railway & Electric Company and several light and power companies. The new company is capitalized at $10,000,000, $5,000,000 preferred and $5,000,000 common stock. The officers are Edward M. Freese, president; Howard Corning, treasurer and clerk. Edward M. Graham, Albert E. Bass, Charles D. Stanford, J. Norman Towle, A. Langdon Freese, Howard Corning and Frank Silliman, all of Bangor, are directors.

**City Votes Funds for Railway Purchase.**—The City Council of Toronto has authorized an issue of general consolidated loan debentures to the amount of $2,000,000, part of this sum to be applied to acquire the Toronto & York Radial Railway.

**Carhouse Site Bought for Amusement Palace.**—George L. (Tex) Rickard, boxing promoter and president of the New Madison Square Garden Corporation, has announced the purchase of the carhouse of the Eighth Avenue Railroad, New York, on Eighth Avenue from Forty-ninth to Fiftieth Streets, where the corporation plans to erect a building devoted exclusively to amusements. The transaction involved the payment of $2,000,000 to the Eighth Avenue Railroad, present occupants of the site.

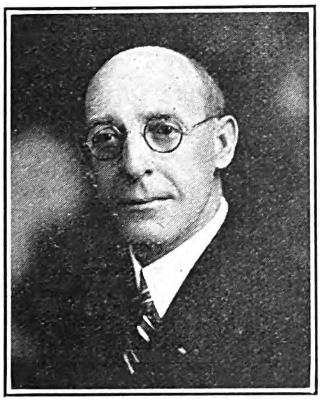
**Northern Ohio Bonds Offered.**—The National City Company, New York, is offering $1,250,000 general and refunding mortgage 6 per cent gold bonds of the Northern Ohio Traction & Light Company, Akron, Ohio, series due 1926, at 99 and interest, yielding more than 6.54 per cent.

**Abandonment Routes Stated.** — Declaration of abandonment of route has been filed in the office of the Secretary of State at Albany by the Dry Dock, East Broadway & Battery Railroad, operating on First Avenue from Fourteenth to Thirty-fourth Street; the St. Nicholas Avenue Railway, on First Avenue from Forty-second to Thirty-fourth Street, and by the Belt Line Railway Corporation, on First Avenue from Twenty-third to Fifty-ninth Street, on Twenty-third Street from First Avenue to Avenue A, on Avenue A from Twenty-third Street to Seventeenth Street, New York City.

# Personal Items

## Charles W. Ford Heads Mid-West Association

Charles W. Ford, superintendent of the Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo., since 1914, was elected president of the Mid-West Electric Railway Association, at its recent meeting in Omaha. Mr. Ford has been associated with many railway properties, beginning his railway career very early in life with the old New Orleans Traction Company, which was at that time engaged in the electrification of the horse car lines. He remained with this company in the mechanical department for two years and left to enter the mechanical department of the Galveston City Railway, later going into transportation work with this property. Following the rehabilitation of this property he served as head of the transportation department.



C. W. Ford

His next position was general superintendent of the company now known as the Oklahoma Railway, which had been known as the Metropolitan Railway of Oklahoma City. With this property he was in charge of construction and operation, completing the first 5 miles of city lines, which were placed in operation in 1903. He remained with the Oklahoma property through the development of its city and interurban lines until 1910. In that year he became identified with the Grand Junction & Grand River Valley Railway, with headquarters at Grand Junction, Col. For two years he served this company as general superintendent, having in charge its city and interurban lines, as well as the property of the Grand Junction Light & Power Company.

But his already wide experiences were not to stop there. He returned south again. In 1912 he left the Colorado properties to serve as general superintendent of the utilities controlled by a Canadian company consisting of the New Orleans Southern & Grand Isle Railway (a steam line) and the Algiers Railway & Light Company, operating railway, light and power properties on the Algiers side of New Orleans. Two years later he went with the Kansas City, Clay County & St. Joseph Railway and now holds the offices of general superintendent and purchasing agent of that property.

## Major Burpee Vice-President at Ottawa—Other Changes Made

Appointments have been made to the offices held by the late Warren Y. Soper in the various associated Ottawa companies that are connected with the names of Ahearn & Soper.

Major F. D. Burpee, formerly manager, is placed on the board of directors of the Ottawa Electric Railway and is elected vice-president. Major Burpee is also made vice-president of the Ottawa Traction Company, Ltd., of which he was already a director.

Kenyon Fellowes, inspector of federal taxation for the district of Ottawa, is elected to the board of the Ottawa Car Company, Ltd.

The vacancy on the board of the Ottawa Traction Company is filled by the election of Otis Whelen.

Frederic Bronson becomes vice-president of the Ottawa Light, Heat & Power Company, the holding company and owner of the stock of the Ottawa Electric and the Ottawa Gas Companies, of both of which Mr. Bronson also is elected vice-president. He succeeds Mr. Soper in these offices, which were held for twenty-five years previous to Mr. Soper's régime by Mr. Bronson's father, E. H. Bronson.

Thomas Ahearn becomes president of Ahearn & Soper, Ltd., succeeding the late Mr. Soper. Seymour A. Rathbone, formerly secretary-treasurer, has been elected vice-president and Donald A. Fraser, formerly accountant, succeeds Mr. Rathbone as secretary-treasurer. Mr. Ahearn is president of all of the companies.

## Personnel Changes on Illinois Properties

More changes in the managerial personnel of Illinois properties of the Illinois Power & Light Corporation, effective June 15, were announced recently by William A. Baehr, vice-president and general manager of the company.

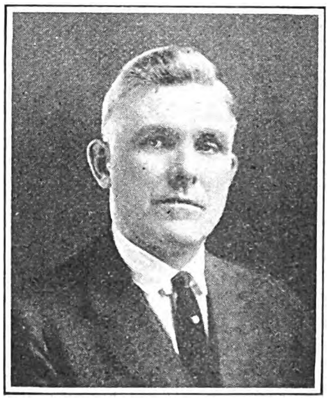
Emil A. Roehry, for the last six years manager of the Cairo Railway & Light Company, Cairo, Ill., has been promoted to division manager of the company's properties at Champaign, Ill., to succeed Frank W. Bedard, promoted to a wider field of endeavor created by the company.

The position of manager of the Cairo property will be filled by Harry J. Vance, Chicago. Mr. Vance has been purchasing agent for the Illinois Traction System, a subsidiary of the Illinois Power & Light Corporation, since 1912. The duties of the interurban railway's purchasing agent have been taken over and will, from now on, be handled in the office of W. P. Hendricks, purchasing agent for the Illinois Power & Light Corporation.

## Carl H. Allen Installs Safety Cars

When the Illinois Traction System decided to install the safety interurban cars, commonly known as the "one-man" interurban car, on the Illinois Valley division of the system the company selected Carl H. Allen, one of the best posted men in the country on this style of car, as an expert skilled in the handling of equipment of this type. It then created a new office for him—that of superintendent of the Illinois Valley division of the Illinois Traction System. This appointment, which became effective May 15, was referred to in the ELECTRIC RAILWAY JOURNAL, issue of May 17. The division he oversees extends from Ottawa to Joliet and Streator, Ill. The new cars will begin operating in July.

Mr. Allen began his railway career at Indianapolis with the Indianapolis Traction & Terminal Company. For the last eighteen years he has been associated with various railways, among them the Michigan Railway, Jackson, Mich.; the Rockford Interurban Company, Rockford, Ill., and the Wisconsin Public Service Corporation, Green Bay, Wis. It was while in the service of the last-mentioned company that the one-man interurban car was put in operation and proved a big success.



C. H. Allen

**R. C. Rogers** has succeeded the late William Vincent Brumby as editor of the United Railways "Bulletin," published monthly for the employees of the United Railways, St. Louis, Mo. Mr. Rogers was at one time a New York and Louisville newspaper man. More recently he has been in charge of the northwestern department of the William Burns National Detective Agency.

**Donald Finkbeiner**, who has been connected with the law firm of Tracy, Chapman & Welles at Toledo ever since he was graduated in law from the University of Michigan in 1920, has been appointed claims attorney of the Community Traction Company, Toledo, Ohio, to succeed the late V. J. Waltz. He has been associated with a number of electric railway cases while with the Tracy, Chapman & Welles firm. He was an attorney for the receivers of the Toledo & Western line before its sale to Frank R. Coates, representing the Doherty interests.

# C. E. Morgan Heads New York Association

### Brooklyn City Railroad Official Elected President of New York Body for Coming Year—Career in Middle West and in Brooklyn Reviewed

CLINTON E. MORGAN, vice-president and general manager Brooklyn City Railroad, was elected president of the New York Electric Railway Association at the meeting at Long Beach, N. Y., on June 21. With respect to the recital of the career of Mr. Morgan there is no desire here to out-Henty Henty by proving that virtue is its own reward. On the other hand, there is no use trying to apply the yardstick of conventional criterion to a career such as that of Mr. Morgan. The achievements of the man cannot be measured that way.

Some cynics tell the truth about men at the expense of love. On the other hand, the greatest biographer of them all, Plutarch, discovered virtues in those about whom he wrote that never would have been revealed to a scandalmonger such as Suetonius. Thus digging back into the career of Mr. Morgan for early manifestations of virtue, it is discovered that as long ago as 1899 he was auditor of the Greenfield & Indianapolis Street Railway. Auditors may be inclined to chuckle in glee at this. Like other mortals they are more interested in the rising than the setting sun. From among auditors, however, only those rise who, like Mr. Morgan, make figures their slave rather than become themselves the slave of figures.

Figures have been Mr. Morgan's slave ever since 1899. The record of his connection with the Brooklyn railroad is outstanding proof of that. Largely out of the figures of that property he got his facts when he went there in October, 1919, as assistant general manager under H. H. Porter, and then, applying them to management and men, he was able to restore to a dividend-paying basis a surface street railway system of 525 miles of line that just before Mr. Morgan became connected with it had been returned to the owners following a default by the lessee in the installment of rent due Oct. 1, 1919.

But ardor over the act of recording accomplishment has destroyed the sequence of the story. To go back to the beginning, Mr. Morgan's railway career really began when he entered the construction department of the Indianapolis & Greenfield Rapid Transit Company. All his subsequent railway work up to the time of his appointment to the Brooklyn post was done in the Central West. His Greenfield & Indianapolis association was followed by his becoming assistant general manager of the Indianapolis & Eastern Traction Company. In 1905 he was named superintendent of the Indianapolis & Martinsville Rapid Transit Company, the Indianapolis Coal Traction Company and the Indianapolis & Western Traction Company. Subsequently he was chosen superintendent of the Terre Haute, Indianapolis & Eastern Traction Company.

Mr. Morgan resigned from the Terre Haute, Indianapolis & Eastern on Feb. 1, 1909, to accept the position of general manager of the Indianapolis, Crawsfordsville & Danville Electric Railway, Crawfordsville, Ind. He continued in this capacity until April 1, 1912, when he resigned to assume the general superintendency of the Michigan United Traction Company, the Michigan Railway and the Michigan Railroad, with headquarters in Grand Rapids. From Michigan he went to Brooklyn.

C. E. Morgan

One of the first things Mr. Morgan did in Brooklyn was to conduct a thorough traffic survey of all the surface lines. As a result of this study schedules were revamped more nearly to meet traffic needs and economies were introduced, both direct and indirect, that quickly began to manifest themselves in the operating statements. Mr. Morgan himself described the fundamentals of the methods followed in this survey in an article which he contributed to the ELECTRIC RAILWAY JOURNAL for Sept. 24, 1921. Other innovations of the man introduced in Brooklyn have been described from time to time in these pages.

Engineering talent was not the only endowment Mr. Morgan had to exercise in Brooklyn. The present official personnel of the Brooklyn company is largely of Mr. Morgan's making. Thus there came to Brooklyn after him in due course E. H. Reed, as auditor; J. L. Davis, as engineering assistant; G. W. Jones, as treasurer, and A. Le Roy Hodges, as assistant secretary and treasurer—all from the Middle West. With the principal surface lines cast adrift from the rest of the Brooklyn Rapid Transit System only a skeleton organization existed when Mr. Morgan took up his work there. The changes in personnel and the readjustment of duties that followed were all put into effect without friction. Under the circumstances this in itself was a big achievement. It certified—if certification were necessary—to the ability of Mr. Morgan to manage men and to induce them to play the game with him.

Mr. Morgan was a charter member of the Central Electric Railway Association and has long been active in the work of the American Electric Railway Association. He has in the past served on many committees, particularly committees of the Traffic and Transportation Association. At present he is a member of the committee on company and associate membership of the American Association, chairman of the community section, company section and individual membership committees, a member of the committee on co-operation with state and sectional associations, committee on education and committee on insurance. Mr. Morgan's activities in the committee work of the association are truly indicative of the range of interest of the man and reflect the esteem for his opinions held by the rank and file of the industry.

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**Frank T. Singleton**, Martinsville, Ind., has been appointed a member of the Public Service Commission of Indiana, effective July 1. Mr. Singleton was secretary to the Governor and succeeds Oscar Ratts, whose term expired recently.

**E. S. Meyers** has been appointed superintendent of roadway of the New Orleans Public Service, Inc. Mr. Meyers succeeds G. C. Estill, former superintendent of way and structures. The office of superintendent of structures has been abolished. Mr. Meyers was formerly vice-president and general manager of the Vicksburg Power & Light Company, Vicksburg, Miss. He is a graduate of the course in electrical engineering at Purdue University. As noted previously Mr. Estill has become vice-president and general manager of the Miami Beach Electric Company, Miami, Fla.

## Obituary

**Chauncey Eldridge**, president of the Motor Lubricants Corporation, died suddenly on June 22 in the corporation offices, 17 East Forty-second Street, New York City.

**Dr. Thomas J. Brennan** died at his home, in Flushing, N. Y., recently. He was private secretary to Secretary of the Treasury Manning from 1885 to 1887, was editor of the *Sunday Leader* in Philadelphia in 1877, and in 1881 was traveling correspondent for the Cincinnati *Enquirer*. He was born in Montreal in 1853. In 1896 Dr. Brennan was made assistant secretary of the Metropolitan Street Railway, New York, in which capacity he served for some time.

# Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

## Convention Exhibit Space Going Fast

With the forty-third annual convention of the American Electric Railway Association still more than three months away, the sale of exhibit space is exceeding all records. As an indication of what may be expected the number of applications received through June 25 was 111, compared with 73 on the same date a year ago and 45 two years ago. Requests have been received by the association for 54,861 sq.ft. of floor space as against 37,432 in 1923, and 21,800 in 1922. It is expected by the director of exhibits that by the time of the convention every foot of floor space available for exhibit purposes will have been sold.

The exhibit committee will hold a meeting on July 2 for the allotment of space. After the allotment has been completed notification of the booths tentatively awarded will be sent to all exhibitors. Prompt payment is essential because the association cannot undertake to reserve any space not paid for when it could be sold to other exhibitors. In such circumstances the tentative award of space may be canceled at the option of the officials of the association.

The list of the companies who have already filed application for space at the convention appears below. After the tentative assignment of space has been made a list will be published in the JOURNAL showing the allotments of the various companies.

Air Reduction Sales Company
Alan Wood Iron & Steel Company
Alumino-Thermic Corporation
Aluminum Company of America
American Abrasive Metals Company
American Brake Shoe & Foundry Company
American Car & Foundry Company
American Steel & Wire Company
Anaconda Copper Mining Company
Anderson, A. & J. M., Company
Association of Manufacturers of Chilled Car Wheels

Baldwin Locomotive Works
Beck Duplicator Company
Bethlehem Steel Company
Bridgeport Brass Company
Brill, J. G., Company
Brown-Lipe Gear Company
Buda Company

Caldwell, E. R., & Son Brass Company
Carey, Philip, Company
Carnegie Steel Company
Chicago Pneumatic Tool Company
Chillingworth Manufacturing Company
Chilton Company
Clark-Williams Engineering Company
Cleveland Fare Box Company
Cleveland Pneumatic Tool Company
Consolidated Car Fender Company
Consolidated Car Heating Company

Duff Manufacturing Company
Drew Electric & Manufacturing Company

Eberhard Manufacturing Company
Economy Electric Devices Company
Electric Railway Improvement Company
ELECTRIC RAILWAY JOURNAL
Electric Service Supplies Company
*Electric Traction*

Galena Signal Oil Company
Garford Motor Truck Company
Globe Ticket Company
Gold Car Heating & Lighting Company
Godwin, W. S., Company
Griffin Wheel Company
Gustave Schaefer Wagon Company

Hale-Kilburn Company
Haskelite Manufacturing Company
Hoywood-Wakefield Company
Hyatt Roller Bearing Company

Illinois Steel Company
Ingersoll Rand Company
International Motor Company
International Steel Tie Company
Irvington Varnish & Insulator Company

Johnson, R. F., Paint Company

Keystone Lubricating Company

Lang Body Company
Lorain Steel Company

Metal Safety Railway Tie Company
More Jones Brass & Metal Company

National Brake Company, Inc.
National Carbon Company, Inc.
National Pneumatic Company
National Railway Appliance Company
National Tube Company
North East Electric Company
Nuttall, R. D., Company

Ohio Brass Company
Ohmer Fare Register Company
Okonite Company

Pantasote Company
Paterson Vehicle Company
Perey Manufacturing Company
Peter Smith Heater Company
Petry, N. A., Company, Inc.
Pierce-Arrow Motor Car Company
Portland Cement Association
Powers Accounting Machine Company

Rail Joint Company
Railway Improvement Company
Railway Safety Equipment Company
Railway Track Work Company
Railway Utility Company
Rail Welding & Bonding Company
Reade Manufacturing Company
Reo Motor Car Company
Rooke Automatic Register Company

St. Louis Car Company
Saums, George W., Company
Shanklin Equipment Company
Sherwin-Williams Company
Simmons Boardman Publishing Company
Six Wheel Company
Stafford Roller Bearing Car Truck Company
Standard-Johnson Company
Standard Steel Works
Standard Underground Cable Company
Stucki, A., Company

Templeton Kenly & Company
Texas Company
Timken-Detroit Axle Company
Tool Steel Gear & Pinion Company
Transit Equipment Company

Union Switch & Signal Company
United States Change Making Company
Universal Lubricating Company

Walter Motor Truck Company
Western Electric Company
Wharton, Wm., Jr., & Company, Inc.
Wheel Truing Brake Shoe Company
Wheeler Corrugating Company
White Company

Yellow Coach Manufacturing Company

## Westinghouse Receives Largest Insulator Order

The largest individual order for insulators ever received by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., was placed by Gibbs & Hill for the Virginia Railway.

The order calls for 70,400 standard suspension insulators and 6,100 high strength insulators at a cost of about $200,000. Insulators are part of the equipment being purchased for the electrification of the railway, which will cost altogether $15,000,000.

## Birney Bus Bodies for Houston

The railway buses proposed for use in Houston, Tex., by the Houston Electric Company, mentioned on page 864 of the May 31 issue of the ELECTRIC RAILWAY JOURNAL, have been purchased. They will consist of ten "Birney" all-steel bus bodies mounted on Fageol chassis. They are now under construction at the plant of the American Car Company in St. Louis.

These new buses will generally conform to the bus exhibited by the builder in St. Louis during the Midyear Meeting of the A. E. R. A. last March and described in the issue of the ELECTRIC RAILWAY JOURNAL for April 5, page 553. Some few changes have been made from the sample bus. Thus transverse seats will be used over the wheel housing instead of seats of the longitudinal type, and a steel built-up type cowl will be used instead of cast aluminum.

These buses, in addition to their light but durable steel bodies, have many qualities attractive to the bus-riding public. The interiors are luxuriously finished in mahogany and are equipped with Brill type bus seats upholstered in leather. Each bus will seat twenty-nine passengers.

## Pullman Company's Manufacturing Department Separated

A new company known as the Pullman Car & Manufacturing Company, Chicago, with capital stock of $50,000,000, is in operation following the taking over of the manufacturing properties of the Pullman Company. The new company has acquired all the manufacturing business and properties of the manufacturing department of the Pullman Company. This means the segregation of the manufacturing department from the rest of the Pullman Company. The stock of the subsidiary will be held in the treasury of the Pullman Company and there will be no distribution of stock or assets in connection with the separation. Officers of the new company include D. A. Crawford, president and treasurer, formerly vice-president and assistant to the president of the Pullman Company; Clive Runnells and C. A. Liddle, vice-presidents, formerly vice-presidents of the Pullman Company, and S. W. Gehr, secretary. All these men, with the exception of Mr. Gehr, will also be directors, as well as W. N. Oehm, manager of the works, and Ralph M. Shaw.

## Metal, Coal and Material Prices

| **Metals—New York** | June 24, 1924 |
|---|---|
| Copper, electrolytic, cents per lb. | 12.437 |
| Copper wire base, cents per lb. | 14.875 |
| Lead, cents per lb. | 7.00 |
| Zinc, cents per lb. | 6.08 |
| Tin, Straits, cents per lb. | 43.125 |
| **Bituminous Coal f.o.b. Mines** | |
| Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons | $4.325 |
| Somerset mine run, Boston, net tons | 2.175 |
| Pittsburgh mine run, Pittsburgh, net tons. | 1.875 |
| Franklin, Ill., screenings, Chicago, net tons | 1.825 |
| Central, Ill., screenings, Chicago, net tons | 1.575 |
| Kansas screenings, Kansas City, net tons | 2.50 |
| **Materials** | |
| Rubber-covered wire, N. Y., No. 14, per 1,000 ft. | $6.25 |
| Weatherproof wire base, N.Y., cents per lb. | 17.25 |
| Cement, Chicago net prices, without bags | $2.20 |
| Linseed oil (5-lb. lots), N.Y., per gal. | $0.97 |
| White lead, in oil (100-lb. keg), N. Y., cents per lb., carload lots | 11.625 |
| Turpentine (bbl. lots), N. Y., per gal. | $0.82 |

## *Rolling Stock*

**Pacific Electric Railway, Los Angeles, Cal.**, began receiving on June 13 the initial consignment of an order of fifty all-steel electric interurban passenger cars. The outlay of equipment cost $1,850,000, making the cost of each car $37,000. This additional equipment will be used to augment equipment throughout the company's interurban system, operated in southern California. These cars are somewhat lighter in weight than the company's present 1,200 class all-steel interurban car, weighing approximately 94,000 lb. dead load as compared with dead load of 107,000 lb. to 108,000 lb. for the 1,200 class equipment. The new cars do not carry the so-called California open section but they are entirely inclosed, including the smoking compartment. The interior finish is of mahogany with seats upholstered in Spanish leather. The detailed specifications follow:

| | |
|---|---|
| Date of delivery | June and July, 1924 |
| Builder of car body, | Standard Steel Car Company |
| Type of car | All-steel motor passenger |
| Seating capacity | 60 |
| Weight: | |
| Car body | 40,000 lb. |
| Trucks, each | 12,000 lb. |
| Equipment, approximately | 26,000 lb. |
| Total | 90,000 lb. |
| Bolster centers, length | 32 ft. 0 in. |
| Length over all | 57 ft. 4 in. |
| Truck wheelbase | 6 ft. 8 in. |
| Width over all | 9 ft. 6½ in. |
| Height, rail to trolley base | 13 ft. 4¾ in. |
| Body | All steel |
| Interior trim | Mahogany |
| Headlining | Agasote |
| Roof | Arch |
| Air brakes | Westinghouse automatic |
| Axles | A.E.R.A. 6-in. |
| Bumpers | Hedley anti-climbers |
| Car signal system | Faraday |
| Car trimmings | Adams & Westlake |
| Center and side bearings | Friction |
| Conduits and junction boxes | Crouse-Hinds |
| Control | G. E. type P. C. |
| Couplers, | Westinghouse automatic, air and electric |
| Curtain fixtures | Curtain Supply Company |
| Curtain material | Pantasote |
| Destination signs | Hunter Illuminated |
| Fenders | Eclipse |
| Gears and pinions | G. E. grade M spur |
| Hand brakes | Miner Ideal |
| Heater equipment | Consolidated |
| Headlights | Crouse-Hinds type LAA |
| Journal bearings | Friction, 5-in. x 9-in. |
| Journal boxes | Symington |
| Lighting arresters | G. E. Co. |
| Motors | G. E. 240-A, 4 per car |
| Motors | Inside hung |
| Registers | Ohmer No. 3 |
| Sash fixtures | Adams & Westlake |
| Seats | Hale & Kilburn |
| Seating material, | Pantasote railroad car seat MaH. |
| Slack adjuster | Westinghouse type J-1 |
| Springs | Railway Steel Spring Company |
| Step treads | Feralun |
| Trolley retrievers | Ideal |
| Trolley base | Pacific Electric pneumatic |
| Trolley wheels | 5-in. Kalamazoo |
| Trucks | Commonwealth cast steel |
| Ventilators | Consolidated automatic |
| Wheels | 34-in. rolled steel |

**Union Traction Company, Anderson, Ind.**, is to purchase rolling stock valued at $600,000, including fifteen steel passenger cars, twenty-five freight cars and six city safety cars. A petition has been filed with the Indiana Public Service Commission asking authority to issue $222,000 of collateral notes. This money is to be used for miscellaneous betterments.

**Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo.**, it is reported, has purchased three buses for use in interurban service.

## *Track and Line*

**Birmingham Electric Company, Birmingham, Ala.**, will extend its car line from Fairfield, a suburb of Birmingham, to Rutledge Springs. This line now operates from the business section of Fairfield to the Fairfield works of the Tennessee Coal, Iron & Railway Company, a distance of several miles. The extension will be made down the old right-of-way of the Tidewater line, which was projected to Bessemer in the early days of that line.

**San Francisco, Cal.**—The Board of Public Works recently approved the plans and specifications for the proposed Eureka Valley-Mission-Sunset tunnel as submitted by City Engineer O'Shaughnessy. The cost is estimated at $1,572,654.

**Grand Rapids Railway, Grand Rapids, Mich.**, is putting in new tracks on main streets of the city and near the construction work has posted information to the pedestrian regarding the size of the undertaking. The work will require 9,500 ft., board measure, of white oak ties under special steel work, switches, frogs and rails at the intersection of Lyon Street and Ottawa Avenue. The steel work will cost $12,680 and the total cost is estimated at $20,000.

**Texas Electric Railway, Dallas, Tex.**, plans to extend the East Waco Street line to the Bellmeade shops of the Missouri, Kansas & Texas Railroad at a cost of $50,000.

## *Power Houses, Shops and Buildings*

**Westchester Electric Railroad, White Plains, N. Y.**, was recently granted a writ of mandamus against the city of Mount Vernon to permit the construction of a carhouse on Garden Avenue, at a cost of $1,250,000.

**Public Service Corporation, Newark, N. J.**, has arranged to acquire one of the most valuable single property holdings that has changed hands in the center of Newark in a long time. By obtaining three parcels from the several owners the corporation rounds out purchase of the block bounded by Mulberry, North Canal, Pine and Boudinot Streets. The property adjoins the Public Service Railway Terminal and has great potential value, in view of the proposed use of the Morris Canal, which it fronts, for highway and transportation purposes. It will be held for development.

## *Trade Notes*

**Mitchell Spring Works, Johnstown, Pa.**, manufacturer of coil and elliptic springs for electrical railway equipment, has been taken over by a recently organized concern, to be known as the Mitchell Spring & Manufacturing Company, which is a subsidiary of the Fort Pitt Spring & Manufacturing Company, Pittsburgh. Fred A. Meckert is president of the new company.

**General Electric Company, Schenectady, N. Y.**, is arranging for a conference of college professors to be held at Schenectady from July 7 to Aug. 9. It is expected that each visiting professor will have an opportunity further to acquaint himself with subjects in which he is particularly interested. Twice a week visits of inspection will be made throughout the plant, followed by round-table conferences with the engineers. A one-day trip to the Pittsfield plant is also planned for the purpose of studying the principles of transformer manufacture.

**Wagner Electric Corporation, St. Louis, Mo.**, announces the removal of its Philadelphia office and service station to 1720-26 Callowhill Street.

**Mitchell - Rand Manufacturing Company, New York, N. Y.**, has taken into its organization Edward J. Watson, with residence at Philadelphia. Mr. Watson will call regularly on customers and prospects in Pennsylvania and the Southeastern states with a view to discussing their problems and suggesting service that the company can render as manufacturers and distributors of "Everything in Insulation."

**Perey Manufacturing Company, New York, N. Y.**, has extended an invitation to all its customers to inspect the improved facilities of its new sales office in the Architects Building, 101 Park Avenue, New York City.

## *New Advertising Literature*

**Crouse - Hinds Company, Syracuse, N. Y.**, has issued a twelve-page folder on Arkite-Circuit-Breaking Plugs and Receptacles.

**Heine Boiler Company, St. Louis, Mo.**, has issued a pamphlet on "Building for the Approval of Coming Generations."

**Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.**, has published a thirty-six-page, two-color publication, entitled "Westinghouse Fittings for Pipe Structures," in which is announced a new and complete line of interchangeable pipe fittings for structural work. The publication describes these fittings and gives their application to such work as the erection of outdoor substations, switching equipment, switchboard frames, racks, railings and fences. It contains an unusually large number of photographic illustrations. An adjustable insert for fastening machinery or other equipment to concrete floors, walls or ceilings, another new Westinghouse product, is also described.

**Walter A. Zelnicker Supply Company, St. Louis, Mo.**, has issued Bulletin No. 322, on "Ballast Cars."

**Roller-Smith Company, New York City, N. Y.**, has published Bulletin 110 describing Type HD direct-current portable measuring instruments, and Bulletin 150 describing Type HA alternating - current portable instruments. Each line includes voltmeters, ammeters, milliammeters and wattmeters.

McGraw-Hill Co., Inc. April 12, 1924 Twenty Cents Per Copy

# ELECTRIC RAILWAY JOURNAL

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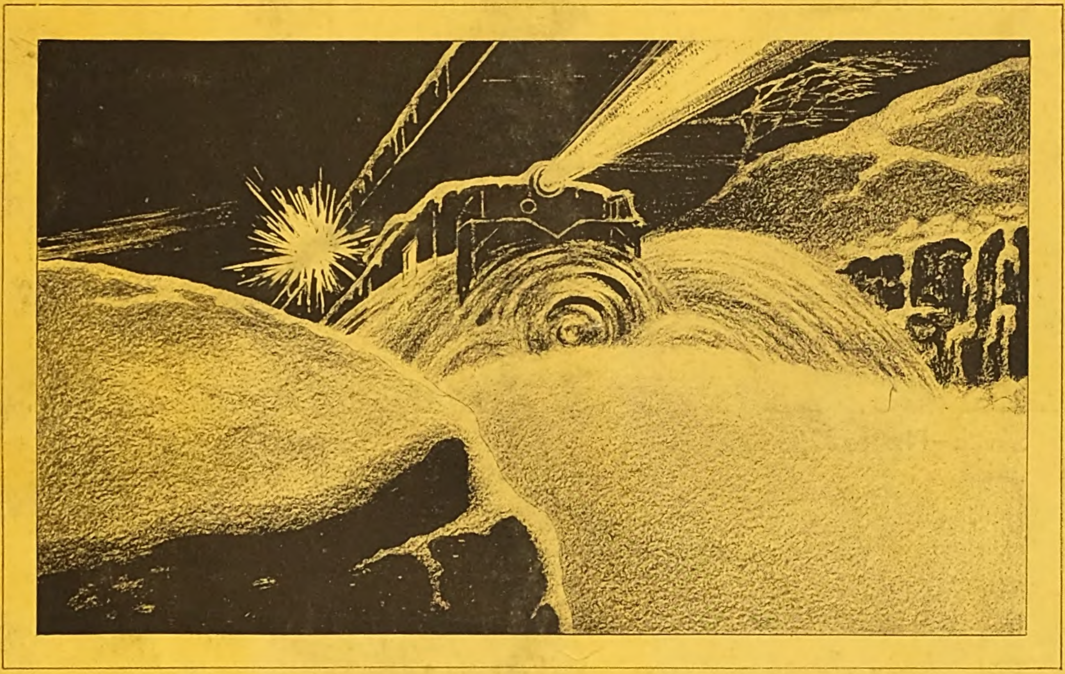


## *Typifying Permanent Endurance*

Buffeted by wind and storm; constantly attacked by heat and cold, by the arcing of uneven trolley wheels, and by current overloads—Phono-Electric has won its spurs for endurance in a hard school.

More than twenty years has passed since this thrice-tougher than copper trolley wire was first introduced. During those twenty years many a record for long life has been made and broken. And today finds Phono-Electric installed in ever-increasing mileage on America's leading electric railways. For endurance becomes synonymous with economy where trolley wire is concerned.

*Details on request.*

**Bridgeport Brass Company**

BRIDGEPORT - CONNECTICUT

NEW YORK CHICAGO PHILADELPHIA DETROIT

Members Copper and Brass Research Association

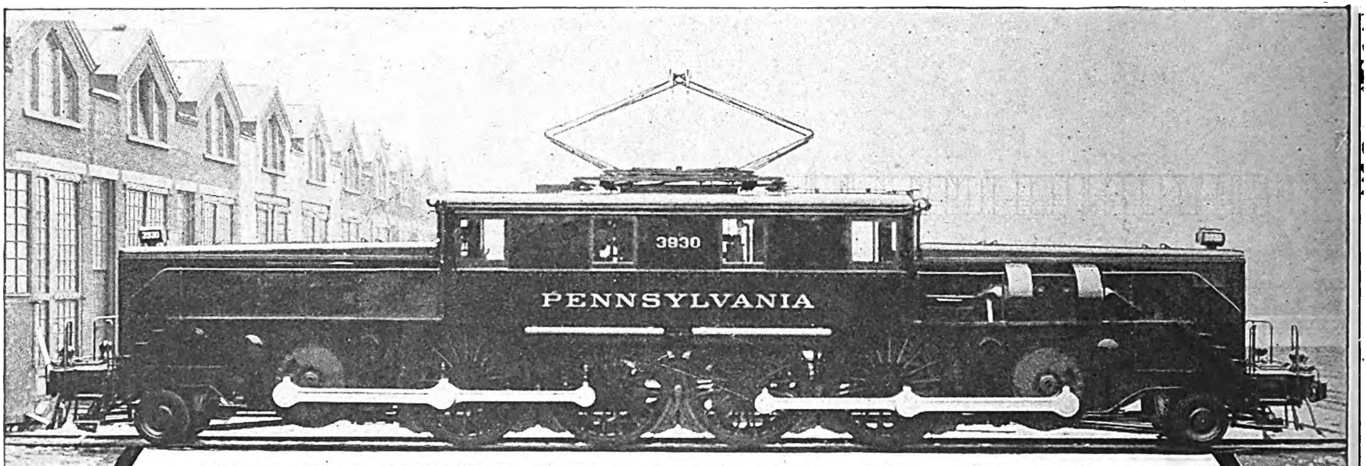
Electric Furnace Products

"Bridgeport" BRASS CO. TRADE MARK

**Phono-Electric**

WE MAKE
Ledrite Brass Rod
Phono-Electric Contact Wire
Plumrite Brass Pipe
Phono-Hi-Strength Wire
Tubular Plumbing Goods
Condenser Tubes-Sugar Tubes
Brass, Bronze and Copper Sheets
Brass, Bronze and Copper Tubes
Auto Bicycle and Pressure Pumps
Auto Accessories-Stampings
Engravers' Copper-Specialties
Screw Machine Products
Pressed or Drawn Products
Oil and Grease Guns

# A New Single-Phase Locomotive For The Pennsylvania Railroad



Single-Phase, 3260 Horse-Power Locomotive for Preference-Freight Service on the Pennsylvania Railroad.

**The Pennsylvania Systems' latest Electric Locomotive has the following distinctive features:**

Largest capacity single-phase motors ever built in this country.

New type of flexible gear, with highest duty in locomotive service.

First flexible pinion used on locomotives in the United States.

Oil-insulated, force-cooled transformer.

Automatic oiling system for jackshaft and motor bearings.

One rigid driving-wheel base.

Apparatus mounted directly on engine frame.

Individual blowers for cooling apparatus.

Accessibility for inspection and maintenance.

Availability for either freight or passenger service by simply changing gear ratio.

**WESTINGHOUSE ELECTRIC & MANUFACTURING CO.**
**East Pittsburgh, Pennsylvania**
**Sales Offices in All Principal Cities of the United States and Foreign Countries**

# Westinghouse

McGraw-Hill Company, Inc. April 19, 1924 Twenty Cents per Copy

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MONTHLY MAINTENANCE ISSUE

# ELECTRIC RAILWAY JOURNAL

ANACONDA
COPPER CONDUCTORS

ANACONDA
COPPER MINING
COMPANY
111 W. *Washington St.,* Chicago, Ill.

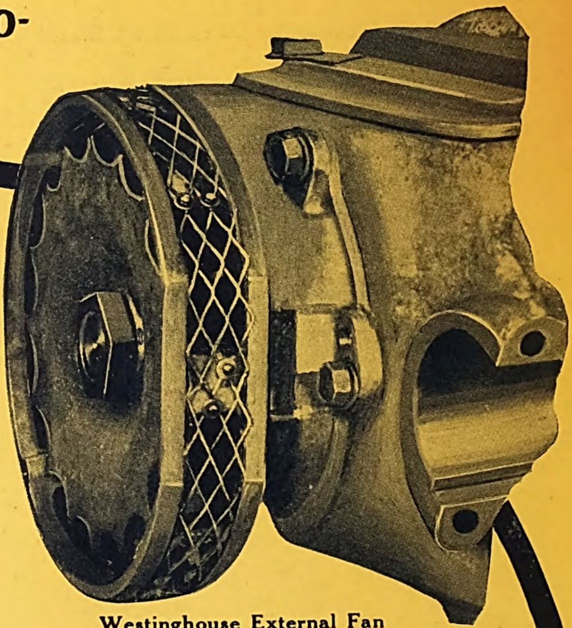
THE
AMERICAN BRASS
COMPANY
*Sales Offices,* 25 Broadway, New York

*Mills:*—Ansonia, Conn. Torrington, Conn. Waterbury, Conn. Hastings-on-Hudson, N. Y. Buffalo, N. Y. Kenosha, Wis. Great Falls, Mont.
*In Canada:*—ANACONDA AMERICAN BRASS LIMITED, New Toronto, Ontario

# HOT AIR !

**"Hot Air" in conversation is always objectionable. - In Railway Motors it is dangerous.**

W
WESTINGHOUSE ELECTRIC



Westinghouse External Fan
with cover removed.

You can overcome conversational hot air by ignoring it, but hot air cannot be ignored in your old overloaded motors. It will be necessary to apply—

**Westinghouse External Fans**

Can you afford to overlook an increase in continuous capacity of from 30 to 50 per-cent?

Our leaflet 20154 gives full particulars.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the
United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION
AERA

# Westinghouse

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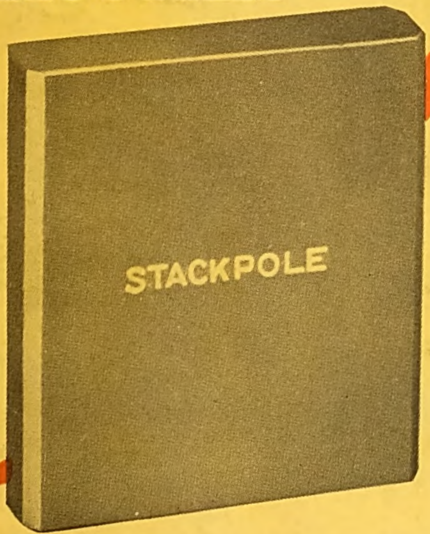
McGraw-Hill Company, Inc. April 26, 1924 Twenty Cents per Copy

# ELECTRIC RAILWAY JOURNAL

**STACKPOLE CARBON BRUSHES**



*The real reason—*

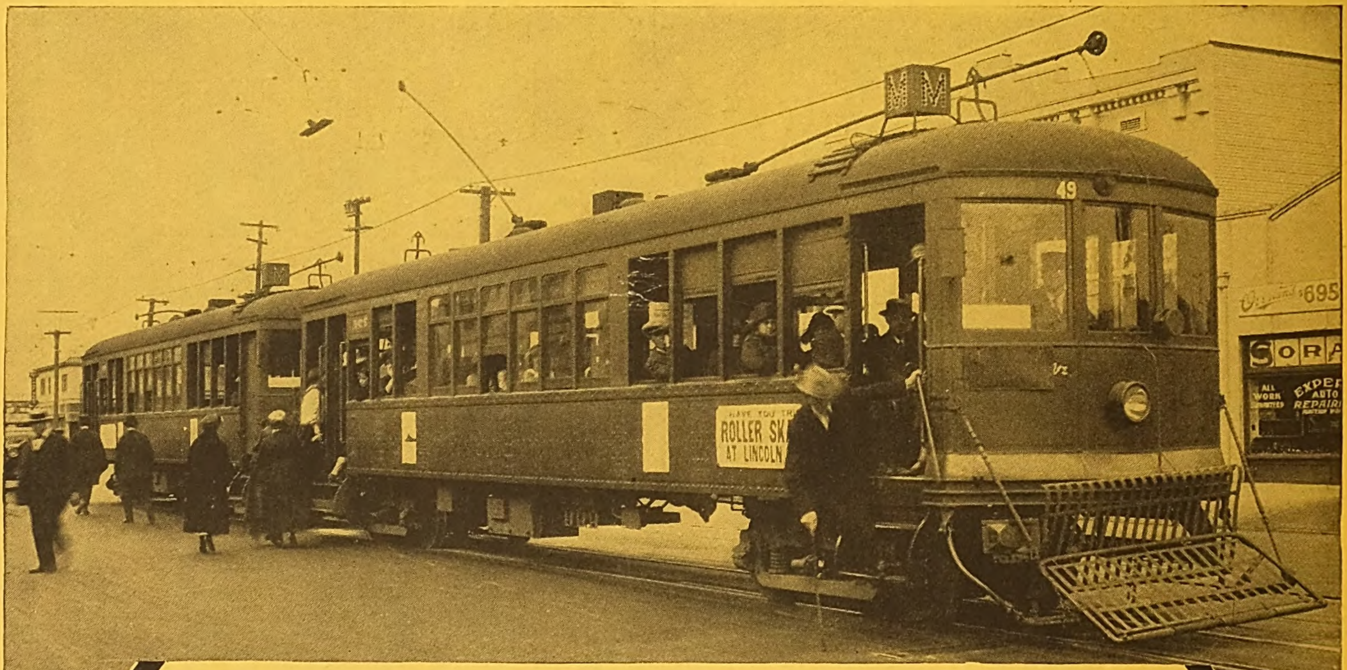
Even motormen notice the improvement in operation, the decrease in commutator troubles and the greater freedom from pull-ins.

What causes it, they ask? The answer is—Stackpole Carbon Brushes.

Grade L-30 is an exceptionally efficient brush, of the utmost uniformity in quality, peculiarly suited to the overloads and heavy duty of traction motors. It is self lubricating, minimizes sparking and affords smooth noiseless commutation.

Prolongs the life of commutators.

STACKPOLE CARBON COMPANY
ST. MARY'S, PENNA.

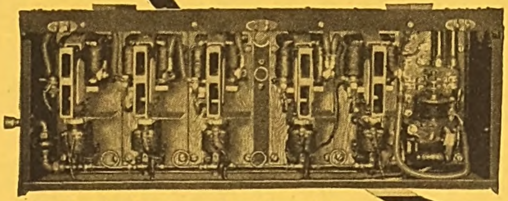


# Keeping Pace With a Growing Demand

The Los Angeles Railways, faced with materially increased demands for mass transportation, recently purchased 120 additional low-floor cars, which are to be equipped with four Westinghouse Type 514-L, 40-hp. Motors and HL Control, arranged for train operation.

Upon delivery of this equipment there will be 1200 Type 514 motors and more than 300 low-floor HL-controlled cars, arranged for train operation on this property.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries



HL Switch Group for Low-Floor Cars

WESTINGHOUSE ELECTRIC

**Westinghouse**

McGraw-Hill Co., Inc. May 3, 1924 Twenty Cents Per Copy

# ELECTRIC RAILWAY JOURNAL

SINCE their introduction into this country in 1904, Rolled Steel Wheels have been steadily developed by the Standard Steel Works Company.

With twenty years of experience to guide us we are today producing the highest grade wheel on the market. A trial wherever service conditions are unusually severe will prove this contention. You will then standardize on Standard Steel Works Wheels.

**STANDARD STEEL**
**WORKS COMPANY**

PHILADELPHIA, PA.

BRANCH OFFICES

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ST. LOUIS
NEW YORK
HOUSTON, TEXAS
PORTLAND, ORE.
RICHMOND, VA.
SAN FRANCISCO
BOSTON
ST. PAUL, MINN.
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LOS ANGELES CAL.
MEXICO CITY, MEX.

WORKS: BURNHAM, PA.

The Chicago, North Shore & Milwaukee Furnishes

SERVICE

Thos. Cusack Co.
USE THE MERCHANDISE DESPATCH
of the CHICAGO NORTH SHORE & MILWAUKEE R.R.
FAST SERVICE BETWEEN WOODLAWN, CHICAGO MILWAUKEE & INTERMEDIATE POINTS
OVERNIGHT DELIVERY ALWAYS ON TIME
RECEIVING STATIONS 4 IN CHICAGO 2 IN MILWAUKEE
W
WESTINGHOUSE ELECTRIC

**Besides maintaining the fastest electric interurban passenger service in the world, this road operates an efficient merchandise dispatch service, thereby rendering the population along its right-of-way the maximum of transportation facilities.**

It is significant that practically all cars on this road
are equipped with Westinghouse Motors and control

Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pennsylvania

*Sales Offices in All Principal Cities of the*
*United States and Foreign Countries*

Member American Electric Railway Association AERA

Westinghouse

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McGraw-Hill Co., Inc.

May 10, 1924

Twenty Cents Per Copy

# ELECTRIC RAILWAY JOURNAL

Latest Type of White De Luxe Bus

## 28 White Busses Run 5,400,000 Miles

A White Bus will run 100,000 miles for you and then keep on rolling up money-earning miles until it has doubled or trebled that mileage. Hundreds that have been in service eight, nine and ten years still continue to do a full day's work for their owners.

The White Transit Co., of Plymouth, Pa., has operated White Busses since 1910. Thirty-three Whites now serve this company and 28 have traveled in the aggregate 5,400,000 miles. Twelve have passed the 200,000-mile mark, while six have rounded out 300,000 miles. They have been written off the company's books several times, but they keep on earning money.

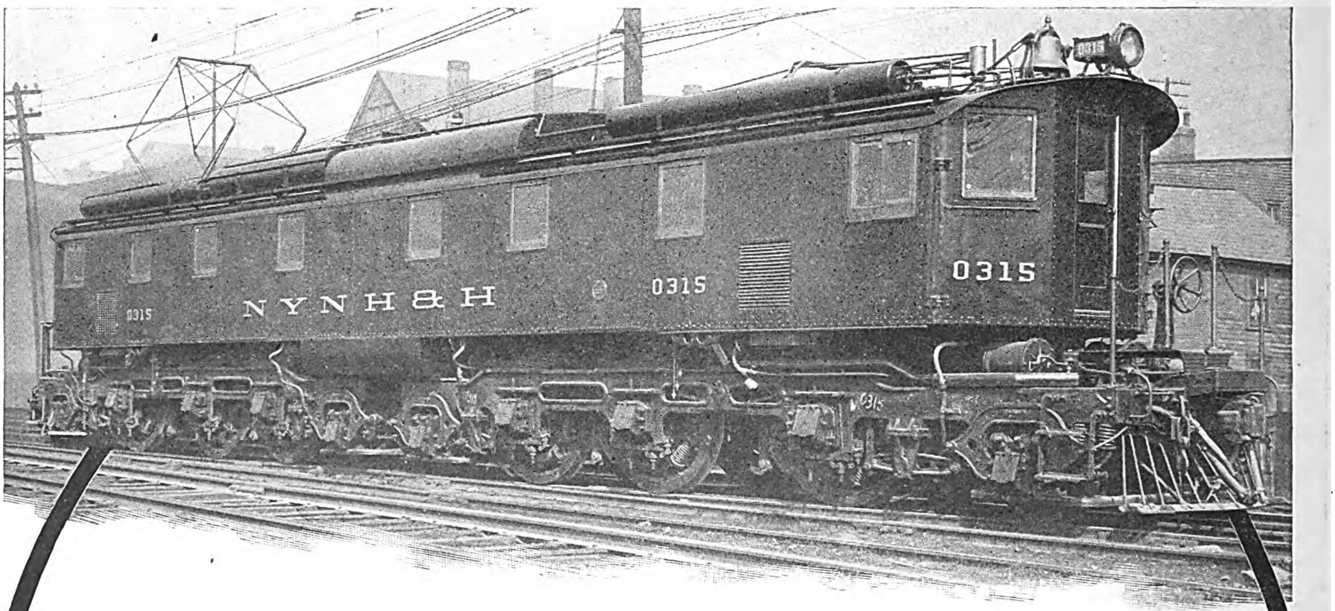
The White Transit Co. is one of 73 companies that operate 2,005 White Busses in fleets of 10 or more. These owners know bus value. Their judgment is your own best guide in spending your transportation dollar.

*Write for a copy of The White Roll Call listing 755 of the country's foremost truck and bus owners operating 28,166 Whites in fleets of 10 or more.*

THE WHITE COMPANY, *Cleveland*

# WHITE BUSSES

# New York to New Haven By Electric



The New York, New Haven & Hartford Railroad have placed in service their 118th electric locomotive, thus enabling complete electric service to be maintained between New York and New Haven.

The pioneer in the alternating-current system has seen the stamp of approval placed on its selection by the Boston & Maine, Pennsylvania, Norfolk & Western and Virginian Railway.

Electrified in 1907, the New York, New Haven & Hartford Railroad has now the most comprehensive electrification in the world. With their recent addition of 12 high-speed 2016 hp. Baldwin-Westinghouse Passenger Locomotives, the New Haven now have 118 electric locomotives for all classes of service.

Address either Company

**The Baldwin Locomotive Works**
Philadelphia, Pa.
**Westinghouse Electric & Manufacturing Co.**
East Pittsburgh, Pa.

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# Baldwin-Westinghouse

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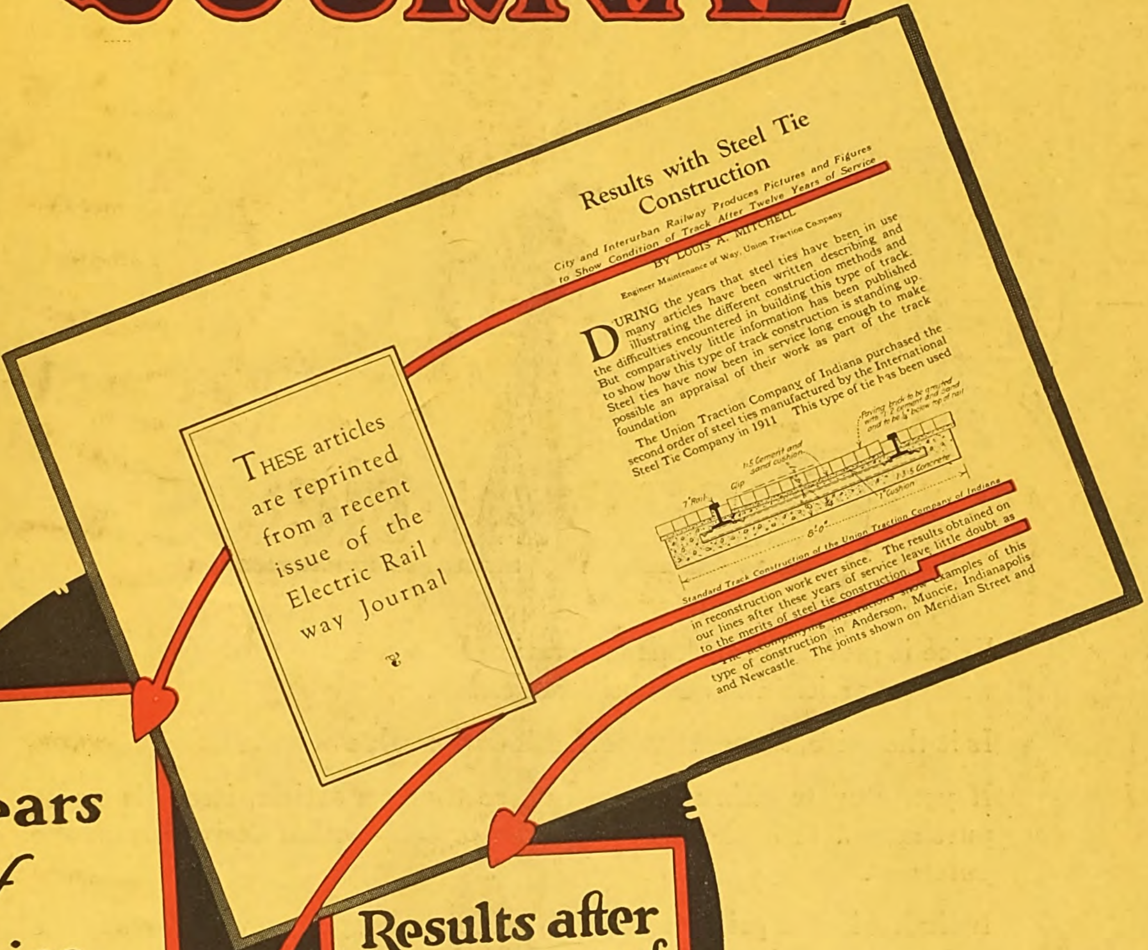
MAINTENANCE ISSUE

ELECTRIC RAILWAY JOURNAL



7" Rail
Clip
1:5 Cement and sand cushion
Paving brick to be grouted with 1:2 cement and sand and to be ¼" below top of rail
1:3:5 Concrete
1" Cushion
¾"
8'-0"

## Results with Steel Tie Construction

City and Interurban Railway Produces Pictures and Figures to Show Condition of Track After Twelve Years of Service

BY LOUIS A. MITCHELL

Engineer Maintenance of Way, Union Traction Company

DURING the years that steel ties have been in use many articles have been written describing and illustrating the different construction methods and the difficulties encountered in building this type of track. But comparatively little information has been published to show how this type of track construction is standing up. Steel ties have now been in service long enough to make possible an appraisal of their work as part of the track foundation

The Union Traction Company of Indiana purchased the second order of steel ties manufactured by the International Steel Tie Company in 1911. This type of tie has been used

Standard Track Construction of the Union Traction Company of Indiana

in reconstruction work ever since. The results obtained on our lines after these years of service leave little doubt as to the merits of steel tie construction.

The accompanying illustrations show examples of this type of construction in Anderson, Muncie, Indianapolis and Newcastle. The joints shown on Meridian Street and

THESE articles are reprinted from a recent issue of the Electric Railway Journal

12 years of service

Results after these years of service leave little doubt as to the merits of steel tie construction

Standard Track Construction of the Union Traction Co. of Indiana

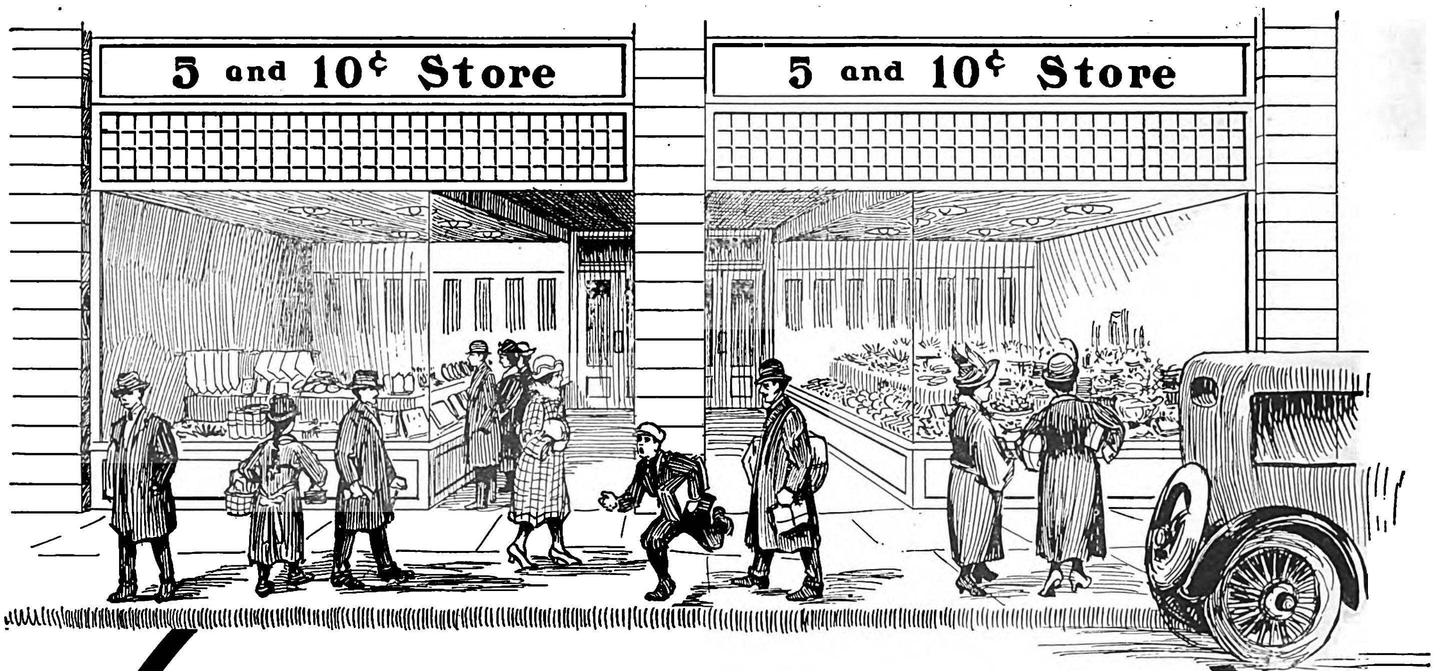
IF your name is on our mailing list this booklet has been mailed to you—Look it up and glance through this article.

Write today for literature and price

**The International Steel Tie Company**
**Cleveland**

# Steel Twin Tie Track

**Economical · Permanent · Renewable**



# Cheap Articles

Price is given so much consideration by some, that we often wonder when an article can be considered cheap.

Is it the price, alone, that determines the value of an article?

If you stop to think you will agree that an article, itself, is never purchased. It is the benefit, profit, or satisfaction derived from the purchase.

Included in the price of Westinghouse Railway Renewal Parts is the satisfaction derived from the quality in materials and workmanship the name "Westinghouse" stands for, and the backing that goes with the Westinghouse Guarantee.

Let us carry a stock for you in our district warehouse.

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MEMBER AERA

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# ELECTRIC RAILWAY JOURNAL

PANTASOTE
TRADE MARK
AGASOTE
TRADE MARK

*Standard for
Electric Railway Cars
and Motor Buses*

THE PANTASOTE COMPANY, INC.

Penobscot B'dg., Detroit Peoples Gas Bldg., Chicago 11 B'way, N. Y. Monadnock Bldg., San Francisco 683 Atlantic Ave., Boston

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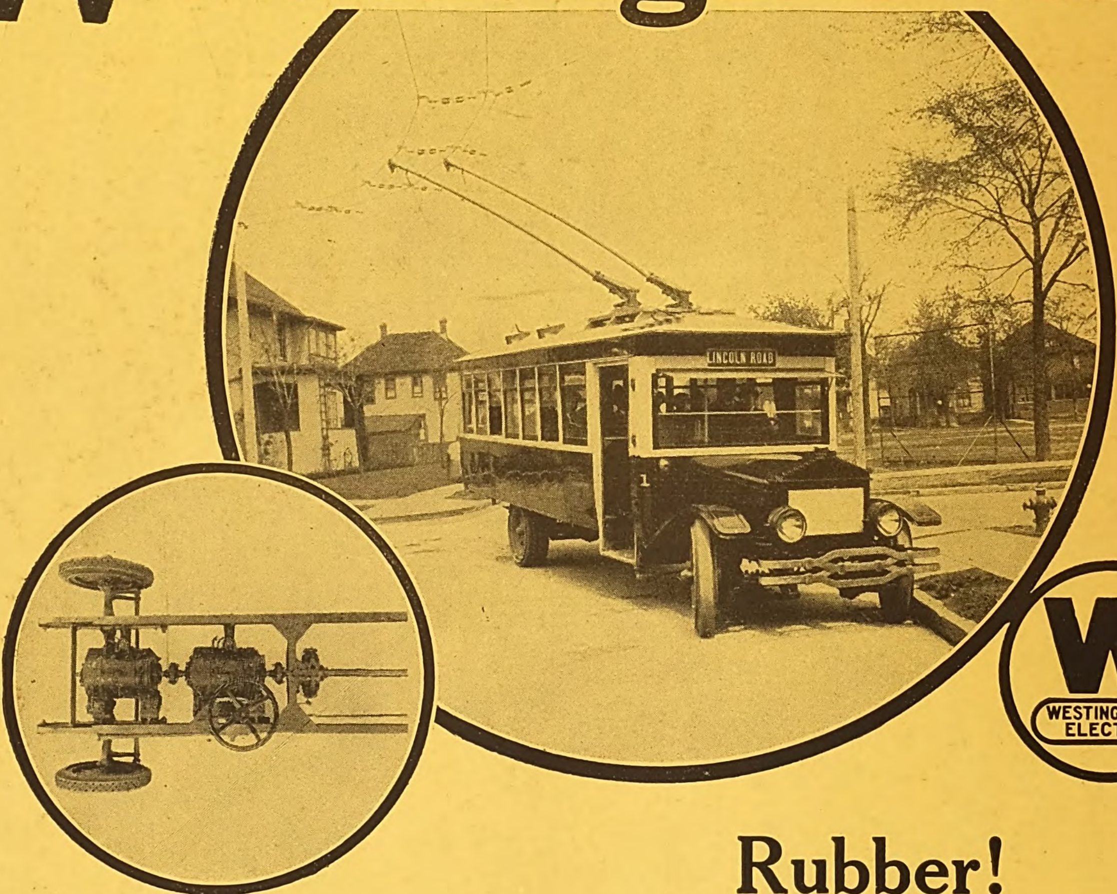

WESTINGHOUSE
ELECTRIC

## Rubber!

Riding on rubber has a fascination which attracts patronage. This fact is demonstrated in almost every large city in the country, by the willingness of the public to pay a high fare for a shorter ride in a bus, than for a longer ride in a car operating on rails.

As your city expands and added facilities are required to extend your system into growing suburban communities —

## Study the Trolley Bus

Its rugged motor and control equipment can be maintained by your regular force.

It derives its power from the same source as your street cars.

It is flexible, comfortable and fulfills many of the transportation needs of a growing community.

Above all, *it paves the way for future extension of your rail lines.*

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TPB

INSTANTANEOUS-REGISTRATION AUTOMATIC POSITIVE
COMPANY - CONDUCTOR
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320

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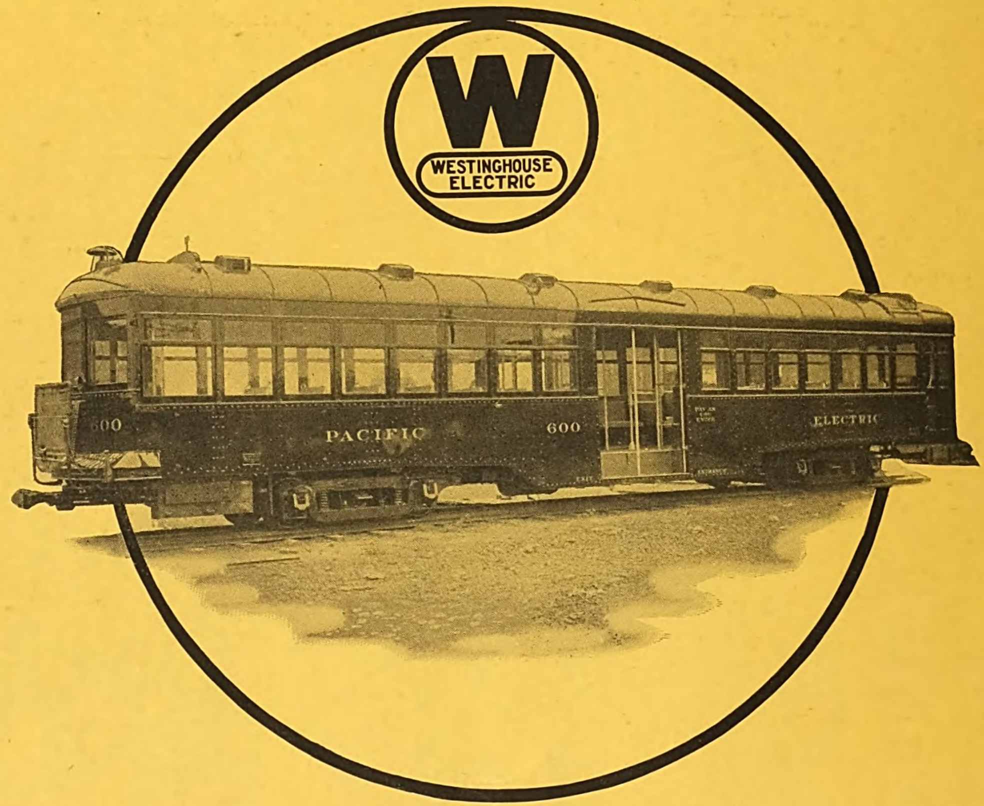
New York Offices, 366 Madison Ave., New York City

# Speed and Comfort with Economy



## Superior Service

The increasing demands of traffic in the Hollywood service of the Pacific Electric Company have resulted in the purchase of fifty additional cars for this service. As in the case of the hundred cars now in operation, the new rolling stock will incorporate many modern features providing for economy of operation and maintenance, such as:

**Train Control**
**Low Floor**
**High Speed**
**Light Weight**
**Long Life**
**Efficient and Accessible Equipment**

Careful thought in the selection of electrical equipment to fulfill these requirements is reflected in the purchase of Westinghouse 50-HP motors and low-floor multiple-unit HL control.

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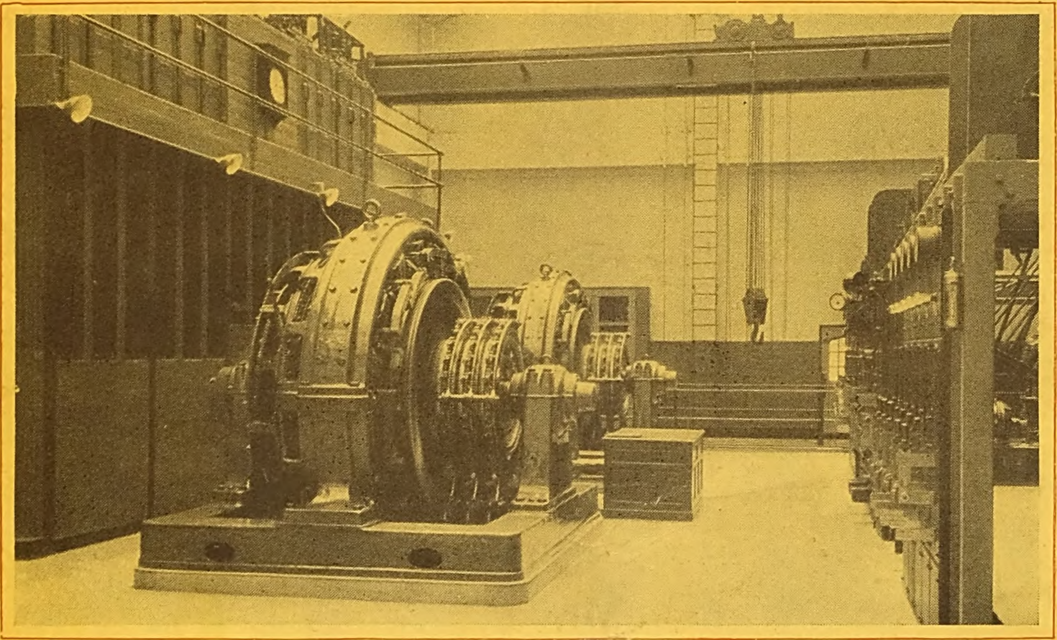
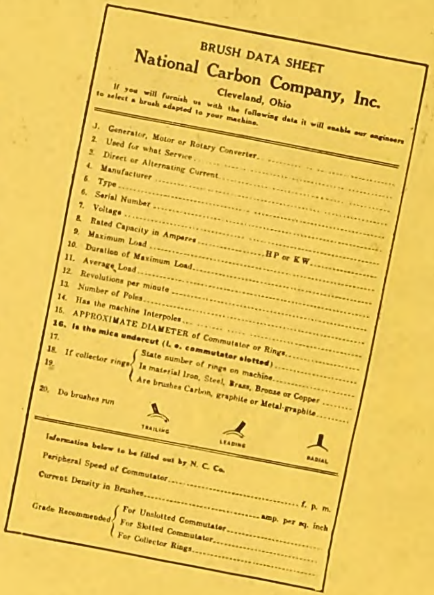


## Pulling cars up the hills of San Francisco

NATIONAL PYRAMID BRUSHES are used on both sides of the 2000 K.W. rotary converters in the down-town substation of the Market Street Railway Co., San Francisco. They give satisfactory, economical service.

These brushes, Grades 259 on the DC side and ET-10 on the AC side, ended some severe troubles on these machines. San Francisco has many steep hills, and when the work of pulling up these hills is added to the natural peak load of the traffic, the machines are subjected to very heavy overloads. These converters are rated at 3333 amperes, but the load jumps to 5000 amperes for short periods. When traffic is at the peak, 4500 amperes must be delivered for as long as thirty minutes.

National Pyramid Brushes stand up under exceptional circumstances. The correct NATIONAL PYRAMID BRUSHES will solve your brush problems. Our Sales Engineers are eager to serve you.



BRUSH DATA SHEET
National Carbon Company, Inc.
Cleveland, Ohio

If you will furnish us with the following data it will enable our engineers to select a brush adapted to your machine.

1. Generator, Motor or Rotary Converter........
2. Used for what Service........
3. Direct or Alternating Current........
4. Manufacturer........
5. Type........
6. Serial Number........
7. Voltage........
8. Rated Capacity in Amperes........
9. Maximum Load........HP or KW........
10. Duration of Maximum Load........
11. Average Load........
12. Revolutions per minute........
13. Number of Poles........
14. Has the machine Interpoles........
15. APPROXIMATE DIAMETER of Commutator or Rings........
16. **Is the mica undercut (I. e. commutator slotted)**........
17.
18. If collector rings { State number of rings on machine........
Is material Iron, Steel, Brass, Bronze or Copper........
Are brushes Carbon, graphite or Metal-graphite........
19.
20. Do brushes run

TRAILING LEADING RADIAL

**Information below to be filled out by N. C. Co.**

Peripheral Speed of Commutator........f. p. m.
Current Density in Brushes........amp. per sq. inch
Grade Recommended { For Unslotted Commutator........
For Slotted Commutator........
For Collector Rings........

**National**
**Pyramid Brushes**

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*Emergency Service Plants*

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Barker Place. *Phone,* SMIthfield 0740

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237 East 41st St.
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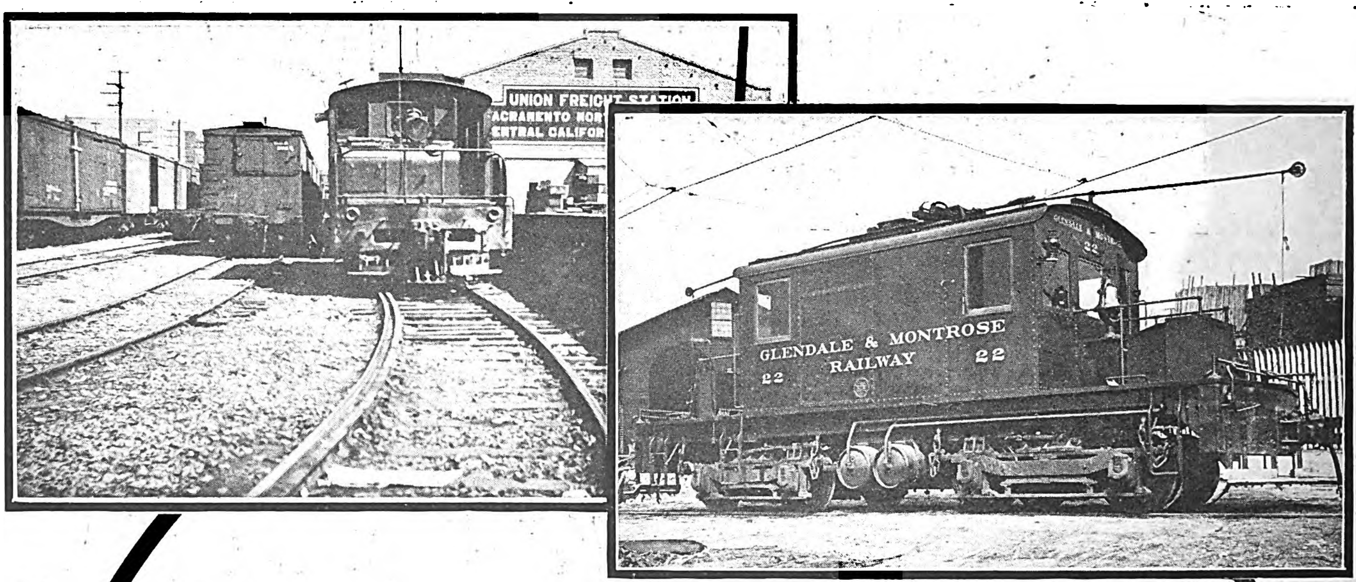
# Simple Arithmetic



## Tonnage + Mileage = Revenue

### More Tonnage + More Mileage + Efficient Motive Power Equals More Revenue

Conditions are constantly changing warranting continuous transportation analysis—Our freight haulage specialists are ready to assist you in studying your existing or proposed service.

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**East Pittsburgh Pennsylvania**
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# ELECTRIC RAILWAY JOURNAL

The Evidence-

is all in their favor. After a thorough trial, under most severe operating conditions—careful inspection shows longer brush life, less side wear and perfect commutation.

Grade L-30 Stackpole Carbon Brushes are especially made for electric traction motors. Their performance and life under heavy overloads is remarkable. They are self-lubricating and highly efficient.

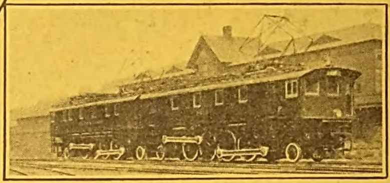
Stackpole Carbon Co.
St. Marys, Pa.

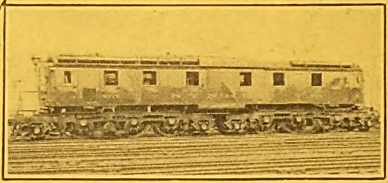
**Stackpole carbon brushes**
the Better Brushes with the Longer Life

# Passing in Review

Chicago, Milwaukee & St. Paul Ry.

Pennsylvania Railroad


Norfolk & Western Railway

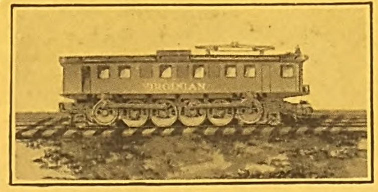

New York, New Haven & Hartford R. R.

Long Island Railroad

Pennsylvania Railroad

Grand Trunk Railway

Boston & Maine Railroad


Virginian Railway

These Motive-Power Units were built to assist the railroads in meeting the difficult operating problems which prevented them from securing the most effective use of their equipment.

In each case they have fulfilled their requirements. The units placed in service as early as 1907 are still carrying on, and meeting their contract guarantees.

Multiple-Unit Trains provide the most efficient means for handling heavy suburban traffic. Their use reduces terminal movements, permits ready adjustment of motive power to handle fluctuating traffic, decreases terminal congestion, and increases track efficiency.

The Westinghouse Company is a leader in Railroad Electrification as evidenced by its successful installations in service.

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June 21, 1924

MAINTENANCE ISSUE

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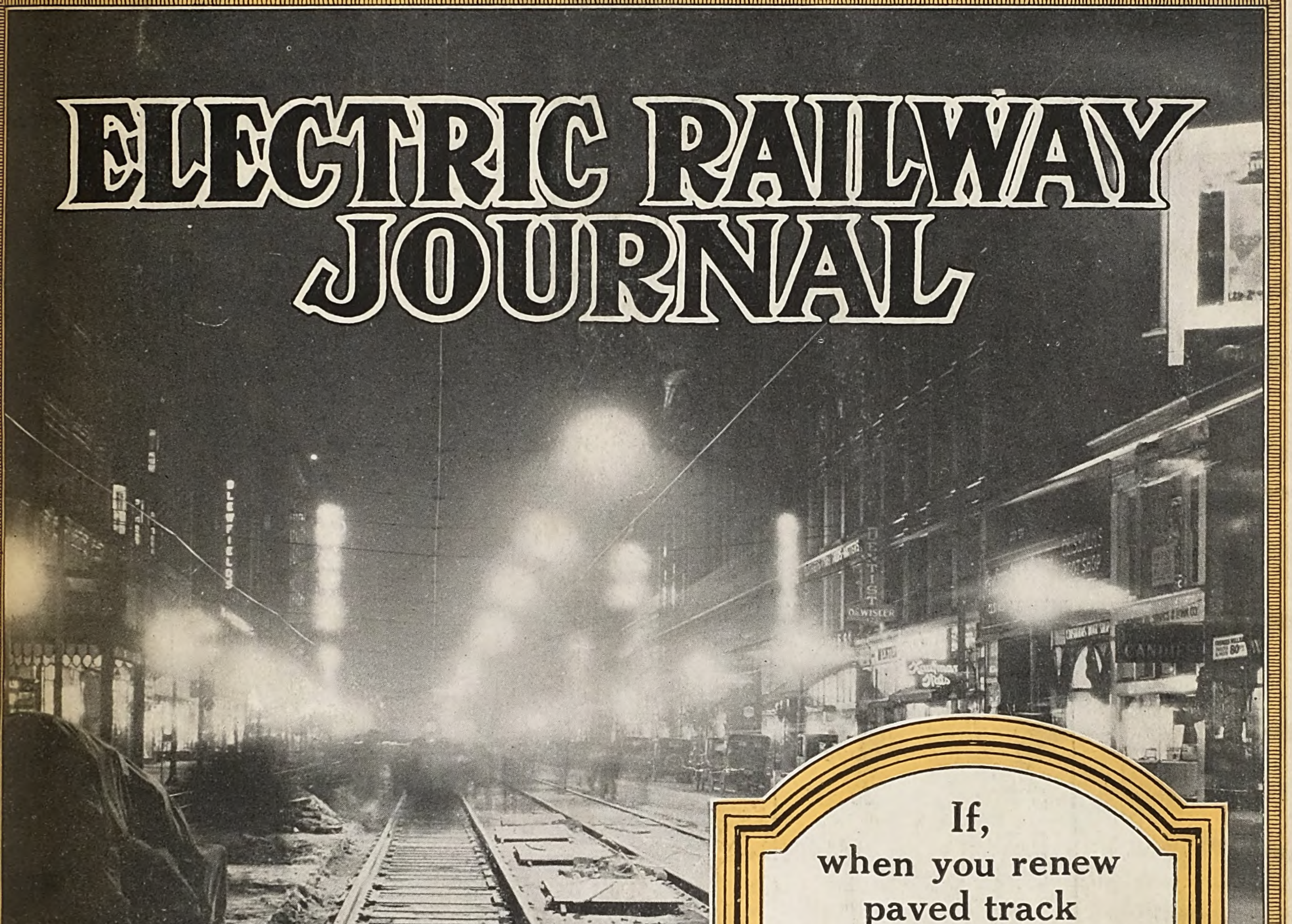


**If,**
**when you renew paved track**

you removed only rail and paving (at only a part of the usual cost of track construction) as is being done on this job you can reduce your cost for track per foot per year OR your track charge per car mile over a long period—It is being done on five miles of heavy traffic track in a metropolitan district.

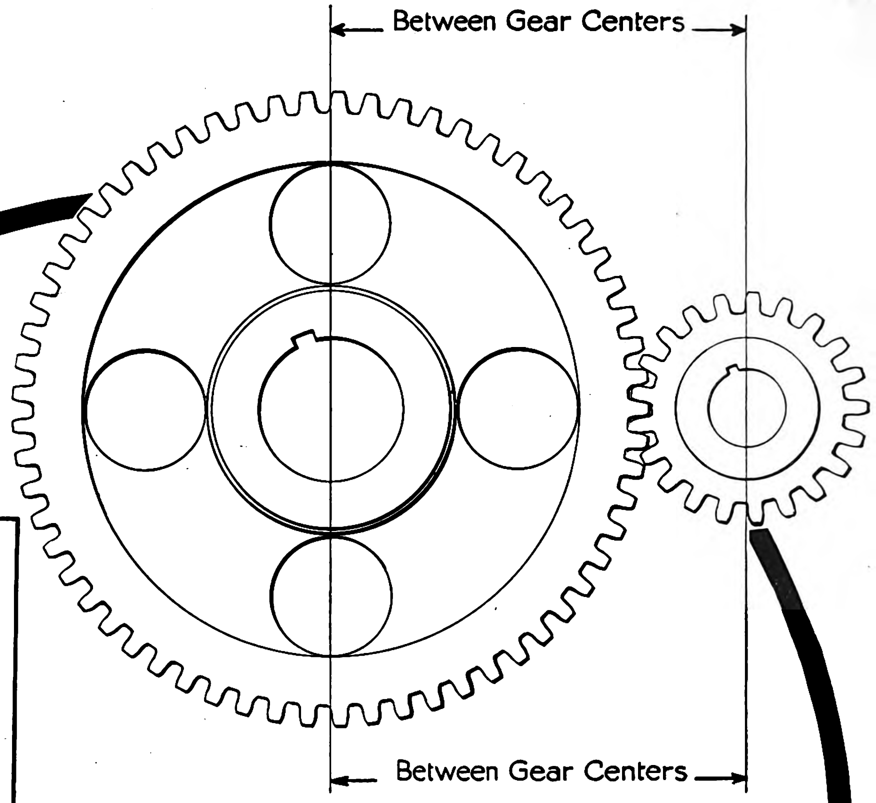
*Ask for the folder, "Years After," giving all the details.*

**The International Steel Tie Company**
Cleveland

Steel Twin Tie Track

Economical Permanent Renewable

# 10 Points To Wear



***Wear of:***

1. Housing fit in frame
2. Frame fit on housing
3. Armature bearing fit in housing
4. Outside of armature bearing
5. Bore of armature bearing
6. Shaft
7. Axle
8. Bore of axle bearing
9. Outside of axle bearing
10. Axle cap and frame bore

Do you realize the importance of holding the proper **Gear Center** dimensions on your motors?

The original bearings, housings and shafts of Westinghouse Railway Motors are machined to thousandths of an inch.

Is it not, therefore, essential that your renewal parts be machined to the same dimensions as the originals?

With our complete tool equipment we are in the best position to furnish you with exact parts.

Buy Westinghouse Renewal Parts for Westinghouse equipment.

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1924

# Westinghouse

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This issue contains the Index for Vol. 63, the first half of 1924

# ELECTRIC RAILWAY JOURNAL

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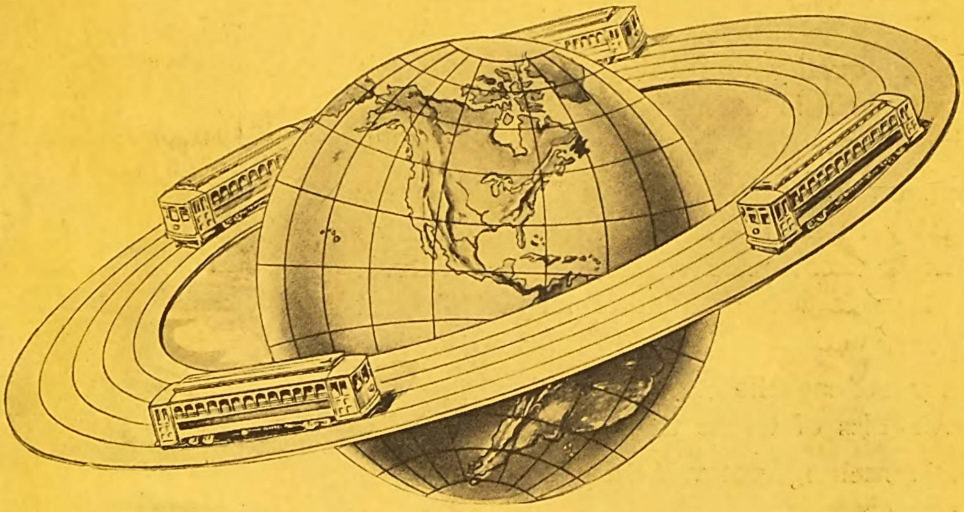

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Car Card
Advertising

BARRON G. COLLIER, Inc., Candler Building, New York City

WESTINGHOUSE ELECTRIC

# LOGICAL REASONING

Babbitts vary in quality and to secure the highest efficiency from each is chiefly a matter of proper pouring temperature.

The Westinghouse Automatic Melting Pot, electrically operated, quickly melts and automatically maintains any babbitt at its most efficient pouring temperature. Bearings thus made are assured of longer life and better wearing qualities.

Better bearings reduce the number of "pull-ins," reduce the possibilities of traffic tie-ups.

The automatic melting pot will help you to reduce your babbitting costs.

Get the whole story in Leaflet 1868. Sent free. Use the coupon.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
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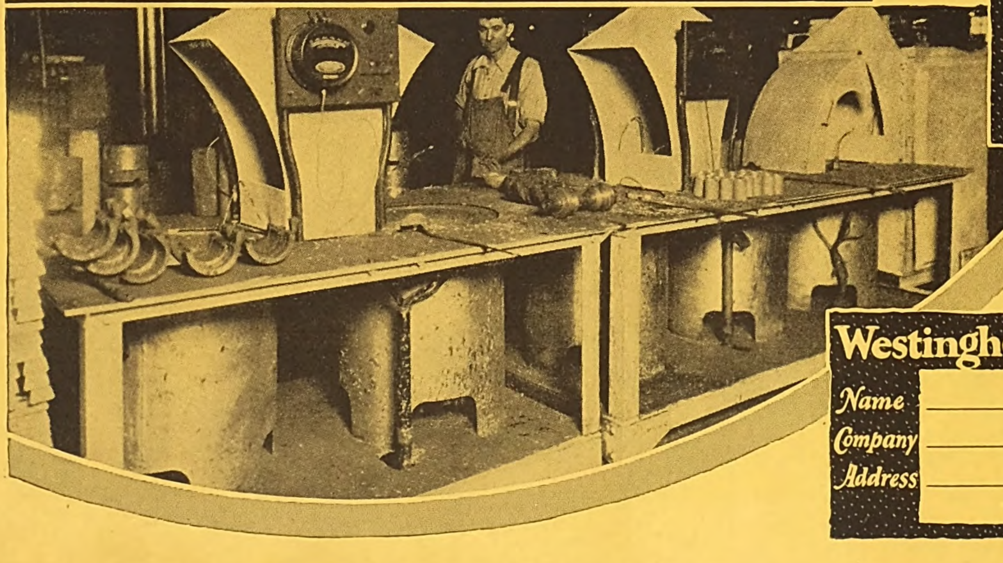
**Westinghouse**

Westinghouse *Automatic* Melting Pots *used for* Babbitting



*The* **Westinghouse** *Automatic* **Melting Pot**

*is heated by*

**Electric Heat**

*which permits*

**Accurate Control** *of the* **Temperature**

*this maintains*

*The* **Proper Pouring Temperature**

*and thus*

**Lengthens Life** *of* **Bearings**

*resulting in*

**Fewer Interruptions** *to* **Service**

*Further information is given in leaflet 1868. Send for it*

Westinghouse Electric & Mfg. Co.

*Name* __________

*Company* __________

*Address* __________

*Vol.* 63, *No.* 26 New York, June 28, 1924 *Pages* 1005-1040

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## *The Index*

THIS week the index to Vol. 63, which covers the first six months of 1924, is published as an integral part of the issue. Unlike many magazines, which defer publication of the index for anywhere from a week to a month, the index to ELECTRIC RAILWAY JOURNAL is complete, including the articles appearing in this, the last issue of the volume.

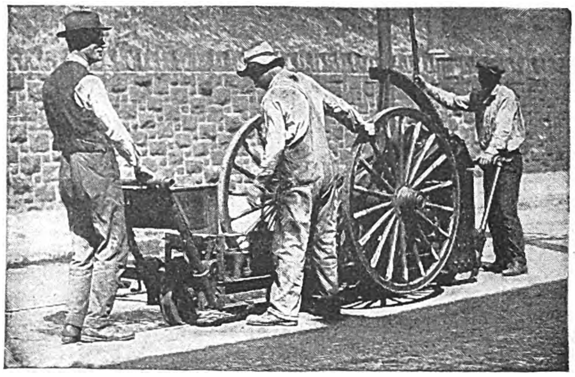
Being bound in as an integral part of the publication, it is not liable to become lost or misplaced as so frequently happens when the index is issued as a supplement. Every subscriber receives a copy. This frequently is not the case where the index is sent separately on request only.

The index is far more than a mere table of contents. Articles are listed under all main subjects to which they have reference, as well as by cities and under the names of cities by the railway companies to which they relate. Then, too, there is a separate index by authors. Thus an article may be listed in several places, making it easy to find not only a particular article, but also every article that deals with any particular subject.

**Number of Copies Printed, 6,115**

**Advertising Index—Alphabetical, 38; Classified, 34, 36; Searchlight Section, 33**

Take a new look at "Old Reliable"



The "Reciprocating" Track Grinder

Most of you know this machine. Maybe you know it so thoroughly that you haven't thought much about it. It has a way of doing its job so well that its owners forget it. We don't think much about the effectiveness with which ordinary breathing-air keeps down the mortality rate. Just so with the "Reciprocating" Grinder and track-mortality. And yet—for removing track corrugations, for grinding new or slightly cupped joints and special work, the Reciprocating Grinder produces a quality of work that has never been equalled.

Through the reciprocating method of grinding, the minimum of metal is removed from the rail head is attaining a smooth tractive surface.

Moreover, it accomplishes this result at the least cost of operation and with least interruption to traffic. Off-again, on-again, grind-again in forty seconds.

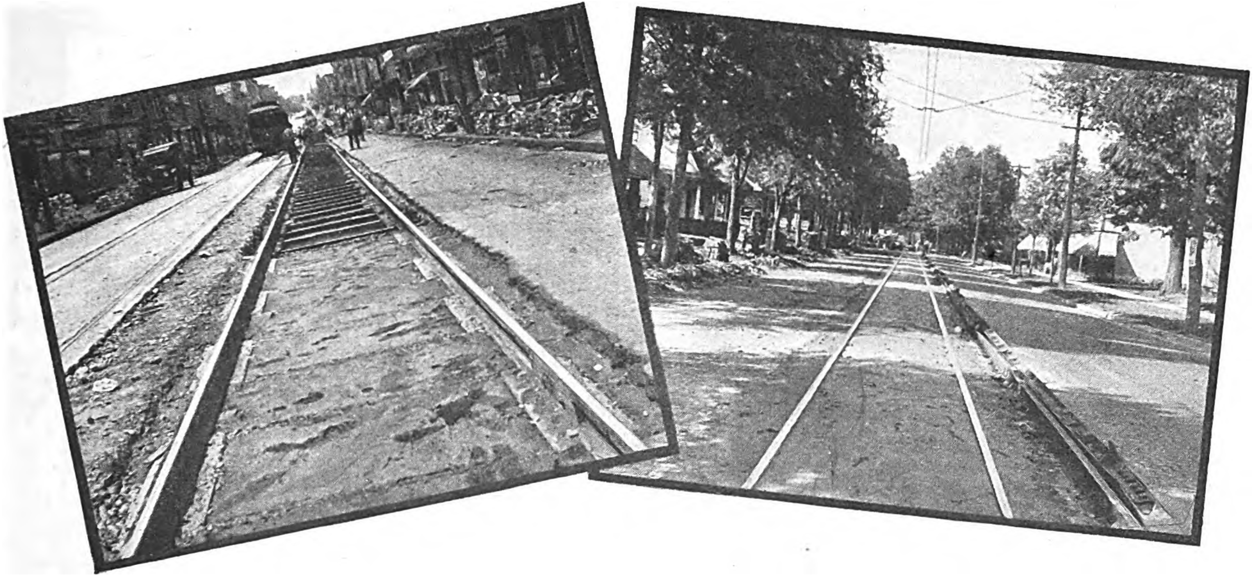
Finally, the rugged construction fits this machine for use even where renewal parts are expensive and hard to get.

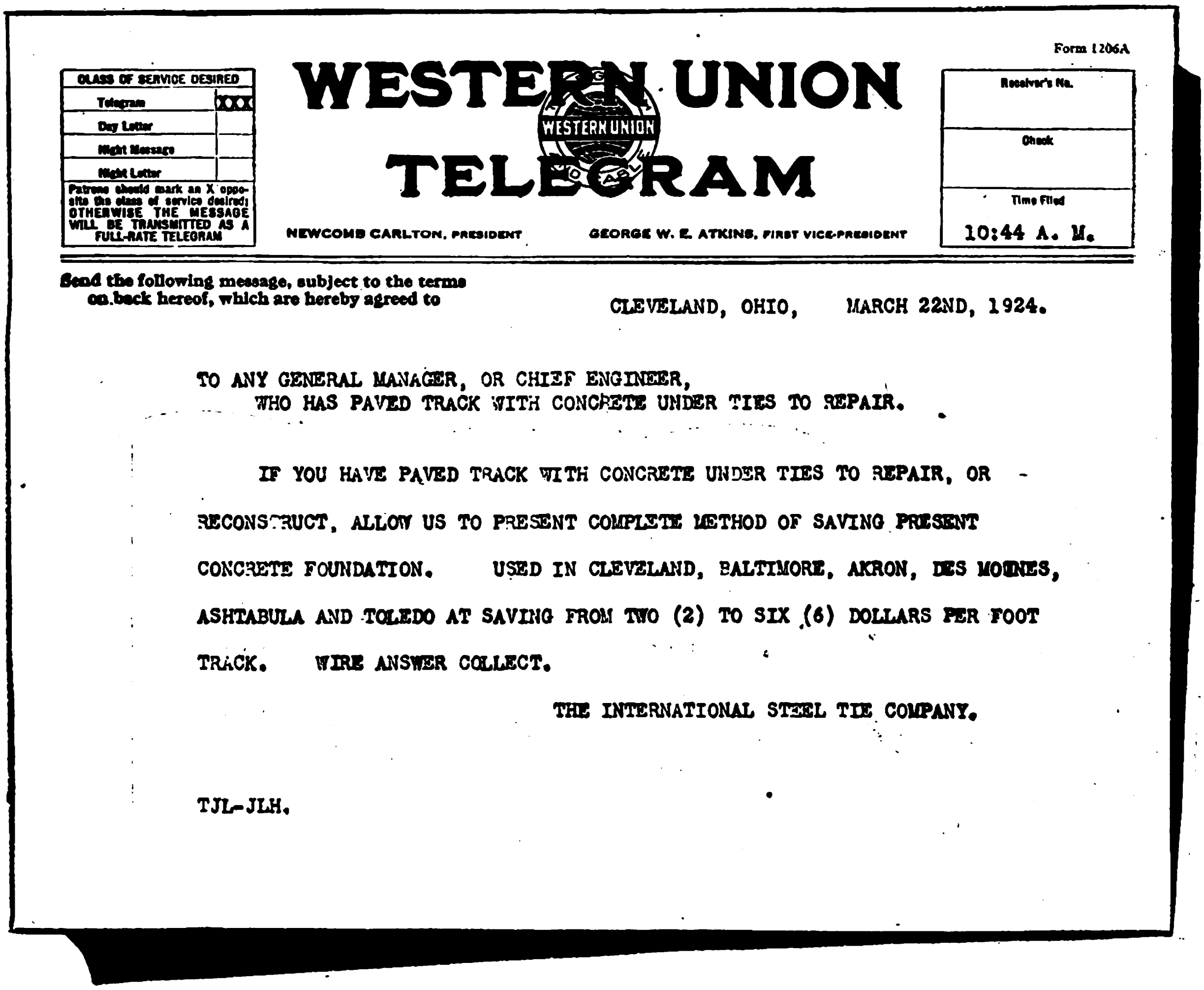
By all means, know the full value of the Reciprocating Grinder. If your road has never used one, let us mail you the bulletin which describes it fully.

**Railway Trackwork Co.**

3132-48 East Thompson Street, Philadelphia

AGENTS:
Chester F. Gailor, 30 Church St., New York
Chas. N. Wood Co., Boston
Electrical Engineering & Mfg. Co., Pittsburgh
Atlas Railway Supply Co., Chicago
Equipment & Engineering Co., London





Form 1206A

CLASS OF SERVICE DESIRED
Telegram XXX
Day Letter
Night Message
Night Letter
Patrons should mark an X opposite the class of service desired; OTHERWISE THE MESSAGE WILL BE TRANSMITTED AS A FULL-RATE TELEGRAM

WESTERN UNION TELEGRAM

NEWCOMB CARLTON, PRESIDENT GEORGE W. E. ATKINS, FIRST VICE-PRESIDENT

Receiver's No.
Check
Time Filed
10:44 A. M.

Send the following message, subject to the terms on back hereof, which are hereby agreed to

CLEVELAND, OHIO, MARCH 22ND, 1924.

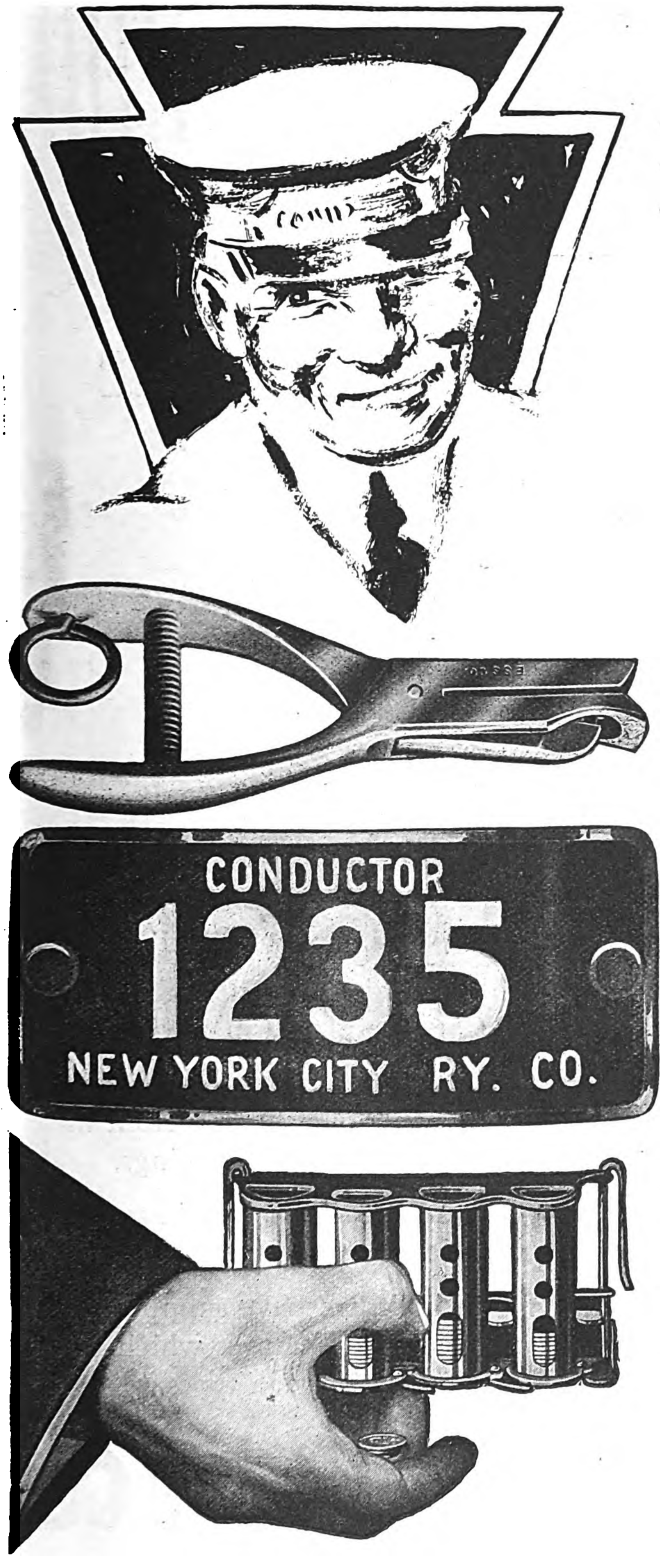
TO ANY GENERAL MANAGER, OR CHIEF ENGINEER,
WHO HAS PAVED TRACK WITH CONCRETE UNDER TIES TO REPAIR.

IF YOU HAVE PAVED TRACK WITH CONCRETE UNDER TIES TO REPAIR, OR RECONSTRUCT, ALLOW US TO PRESENT COMPLETE METHOD OF SAVING PRESENT CONCRETE FOUNDATION. USED IN CLEVELAND, BALTIMORE, AKRON, DES MOINES, ASHTABULA AND TOLEDO AT SAVING FROM TWO (2) TO SIX (6) DOLLARS PER FOOT TRACK. WIRE ANSWER COLLECT.

THE INTERNATIONAL STEEL TIE COMPANY.

TJL-JLH.

Steel Twin Tie Track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## Equipment for Employees

**Uniform Caps**
**Badges**
**Punches**
**Change Carriers**
**Uniform Buttons**
**Insignia**
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**Signal Lanterns**

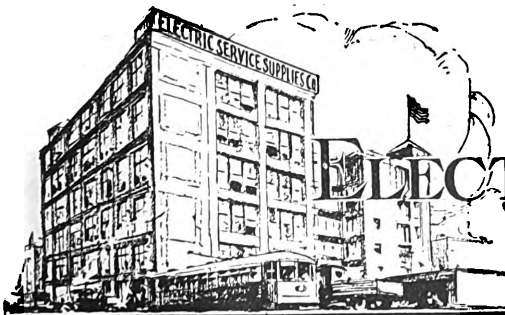
High-grade punches, with widest choice of die shapes where distinctive characters are desired. The well-known "Utility" type punch and also the "Standard" line.

Enameled badges for employees' caps and coats furnished in a wide variety of styles. Well-made and neat, with lettering of utmost legibility.

Change carriers have become more and more a necessity for efficient work, since the advent of the one-man car. Speeds up operation appreciably.

### See Catalog No. 7

for full details and numerous illustrations of employee equipment. Shown in various styles and types which will help you in choosing the right equipment for your requirements.



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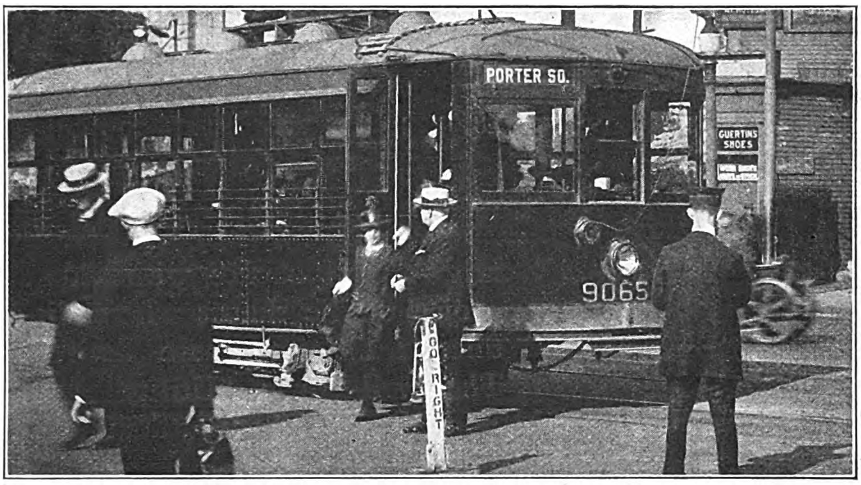

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"Any type of car equipped with *adequate* safety devices for one-man operation."

*A.E.R.A. Committee on Safety Car Operation, 1921*

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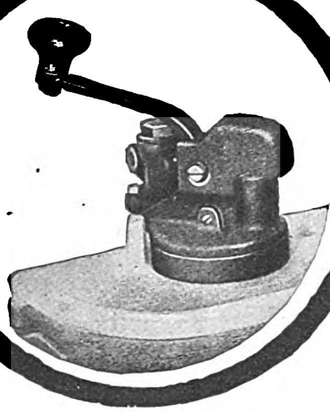
THE saving in operating expense is responsible for the great success of the Safety Car.

This is a *definite* saving which can be estimated almost to the penny before the Safety Cars are placed in service.

And it is a *substantial* saving, a large portion of the daily revenue of each car, which is immediately lifted from the expense column and moved over to swell net earnings.

Is it any wonder that 10,000 Safety Cars are now in service on more than 400 properties?

Since the first Safety Car was built, we have supplied the special Air Brake and Safety Control Features which distinguish Safety Cars from ordinary two-man types.



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**Are partially or wholly equipped with**

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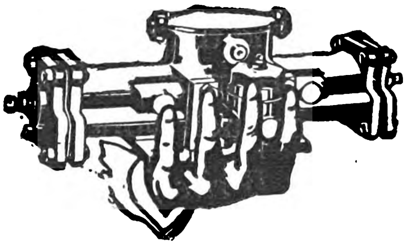

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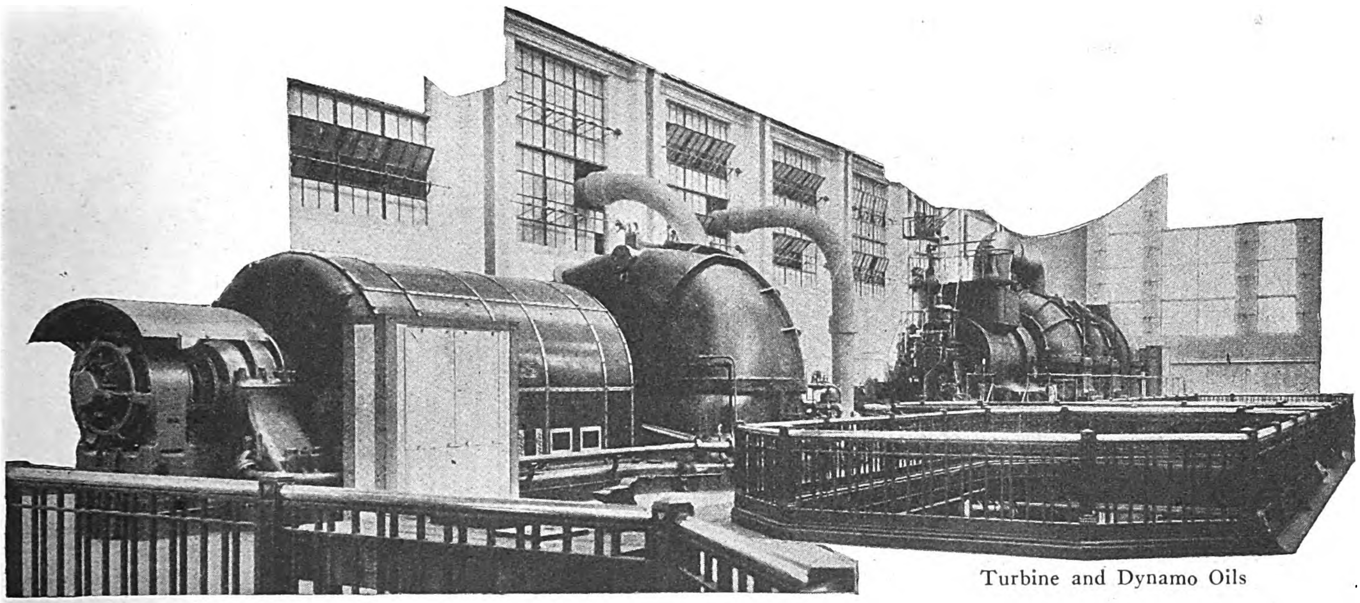

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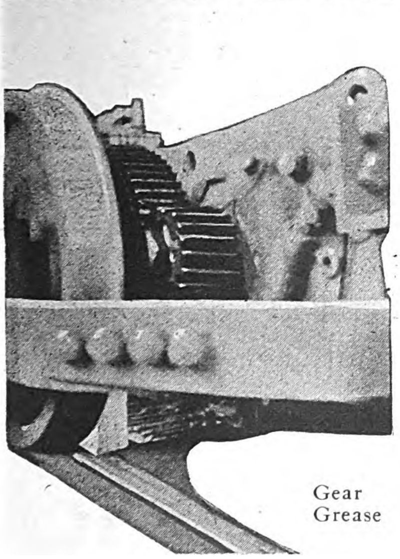

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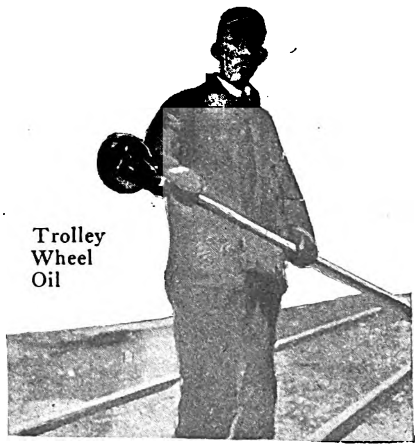
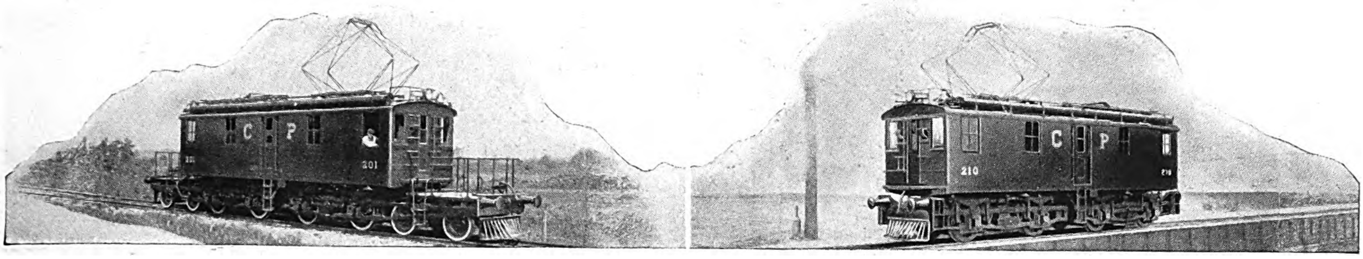


Trolley Wheel Oil

## *Paulista Electrification Results*



# Cost of Electric Operation 1/3 that of Steam

### TOTAL COSTS ON THE BASIS OF A YEAR'S SERVICE OF 465,750 TRAIN MILES

| | Cost per Train Mile | |
|---|---|---|
| | Steam | Electric |
| Operating Trains | 63.09¢ | 19.30¢ |
| Locomotive Repairs | 6.83 | 2.18 |
| Transmission Line Operation and Maintenance | — | 0.46 |
| Trolley Line Operation and Maintenance | — | 1.03 |
| Total | 69.92¢ | 22.97¢ |

THE Paulista Railway was the first steam road in Brazil to adopt electric traction. It furnishes an interesting example of an electrification where the decision to electrify was made solely on these two considerations: greater economy in operation and general improvement in service.

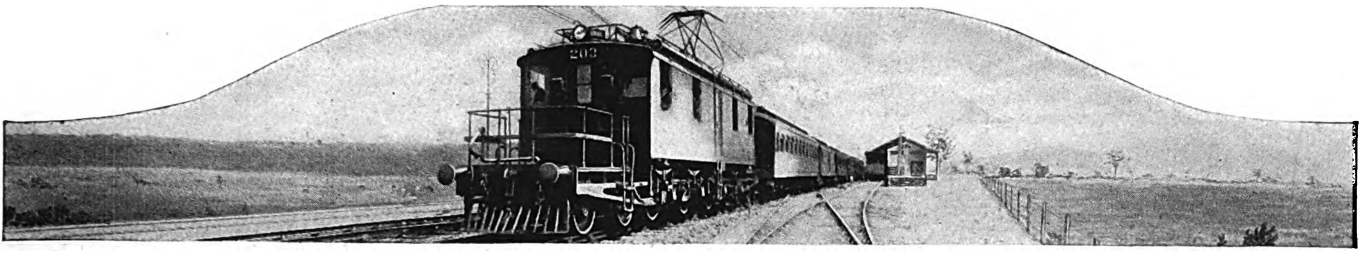
The greatest factor compelling electrification was the high cost of fuel—both coal and wood. Coal is imported, and wood is growing more and more difficult to obtain, with prices increasing in proportion. Therefore, the economy to be gained from this source was established.

The initial electrified section, between Jundiahy and Campinas was 27.3 route miles of double track, the throat of traffic from the interior of Brazil. The use of 3000 volts, direct-current, was decided upon as being the best suited to local requirements, based on the experience with existing installations.

The initial equipment included 10 miles of 88,000-volt double transmission line, 4500-kw. substation equipment, the trolley and distribution system and 12 electric locomotives, built jointly by the General Electric Company and American Locomotive Company. Later the rail-

**AMERICAN LOCOMOTIVE COMPANY**
**GENERAL ELECTRIC COMPANY**

*Paulista Electrification Results*



# Electric Locomotive Maintenance 1/3 that of Steam

## COST OF LOCOMOTIVE REPAIRS AND HEAVY MAINTENANCE

| | Steam | | Electric | |
|---|---|---|---|---|
| | Total Cost 465,750 Train Miles | Per Train Mile | Total Cost 465,750 Train Miles | Per Train Mile |
| Labor | $13,512. | 2.90¢ | $6,250. | 1.34¢ |
| Material | 18,303. | 3.93 | 3,928. | 0.84 |
| Total | $31,815. | 6.83¢ | $10,178. | 2.18¢ |

puted from the following tabulation of power consumption and power regenerated at the locomotives for one month's service. Less than 5 per cent of this energy, that is, of the total regenerated power, is returned to the power company's lines, showing that the railway obtains almost full benefit from the regeneration. In addition to this economy, the saving in maintenance of braking apparatus is considerable.

| Class of Service | Kw-hr. Motoring | Kw-hr. Regenerating | Per Cent Regenerating |
|---|---|---|---|
| Passenger | 303,510 | 30,505 | 10.05 |
| Freight | 363,595 | 57,530 | 15.82 |
| Total | 657,105 | 88,035 | — |
| Average per cent regeneration | | | 13.2 |

Of especial interest is the comparison of power measured at the locomotives to that measured on the power company's lines. This ratio is .837, which shows the high economy of electric power that is made possible by regeneration.

The costs used here are based on the average rate of exchange over the period

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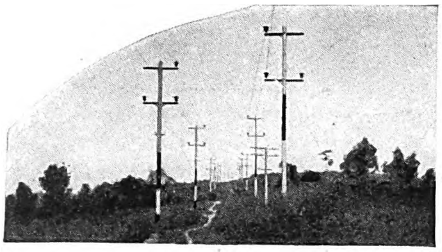
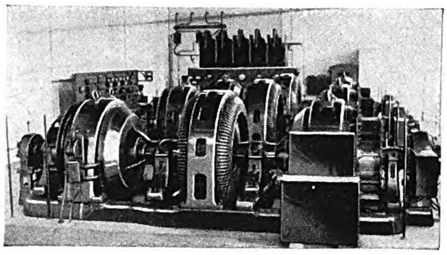
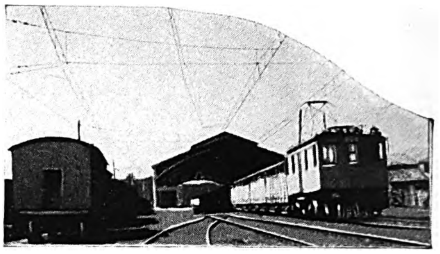
**GENERAL ELECTRIC COMPANY**

## *Paulista Electrification Results*







# Efficiency of Electric Operation—83%
# Average Per Cent Regeneration—13.2

### COST OF OPERATING AND MAINTAINING ELECTRIC SYSTEM

| | 10 Miles of 88,000-volt Transmission Line | | 71.4 Miles of Secondary Distribution System | |
|---|---|---|---|---|
| | Total Cost 465,750 Train Miles | Per Train Mile | Total Cost 465,750 Train Miles | Per Train Mile |
| Labor.......... | $1,865. | 0.40¢ | $4,271. | 0.91¢ |
| Material........ | 272.50 | 0.06 | 559.50 | 0.12 |
| Total...... | $2,137.50 | 0.46¢ | $4,830.50 | 1.03¢ |

for which the costs are figured. These costs are exact, but not strictly comparable with the cost of service in this country, due to the varying exchange. They are intended only to give a comparison of results with electric operation versus steam.

In consequence of the savings made by the initial installation, the Paulista Railway is electrifying 35 additional route miles of single track. For this extension the entire equipment was ordered from the General Electric Company. This includes a new substation of 4500-kw. ultimate capacity, together with high-tension and distribution equipment, also five 3000-volt direct-current switching locomotives, which, like the larger units, were built jointly by the General Electric and American Locomotive companies.

Contracts for the Paulista electrification are carried out by the International General Electric Company through the General Electric S. A. of Brazil.

**General Electric Company**
**Schenectady, N. Y.**

**American Locomotive Company**
**New York, N. Y.**

25-255

# AMERICAN LOCOMOTIVE COMPANY
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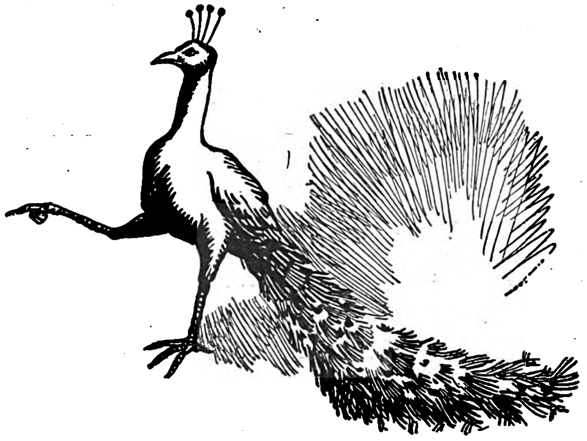
## *Like winding your watch!*

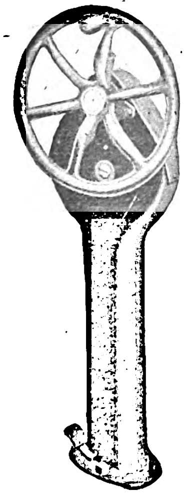
Scarcely any habit we have in life is more regularly practiced than the act of winding our time pieces. Every time we reach the end of another day, we perform this act almost without realizing it.



# Make hand brake practice a habit, too!

Train your motormen to similar regularity in the use of the hand brake. Teach them to make at least one hand brake stop every time they reach certain points on the trip. Then if the emergency ever arises when the hand brake is needed to prevent an accident, you can depend on *habit* to handle the situation, where otherwise the motorman might become panic-stricken.

But don't fail to provide adequate, reliable, and powerful hand brakes for your motormen to use.



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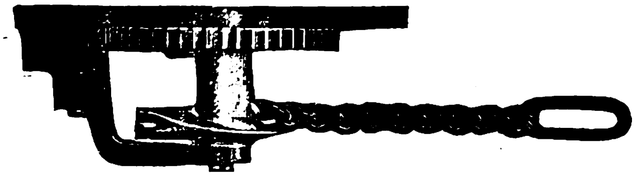
## PEACOCK Staffless Brakes

Especially adapted for the modern, light-weight safety car, both single and double-truck. Minimum platform space, light-weight, high braking power.

## PEACOCK Improved Brakes

Made in suitable sizes and styles for heavier city cars, interurban and rapid-transit cars. Exclusive Peacock features—the eccentric drum and the automatic stop.



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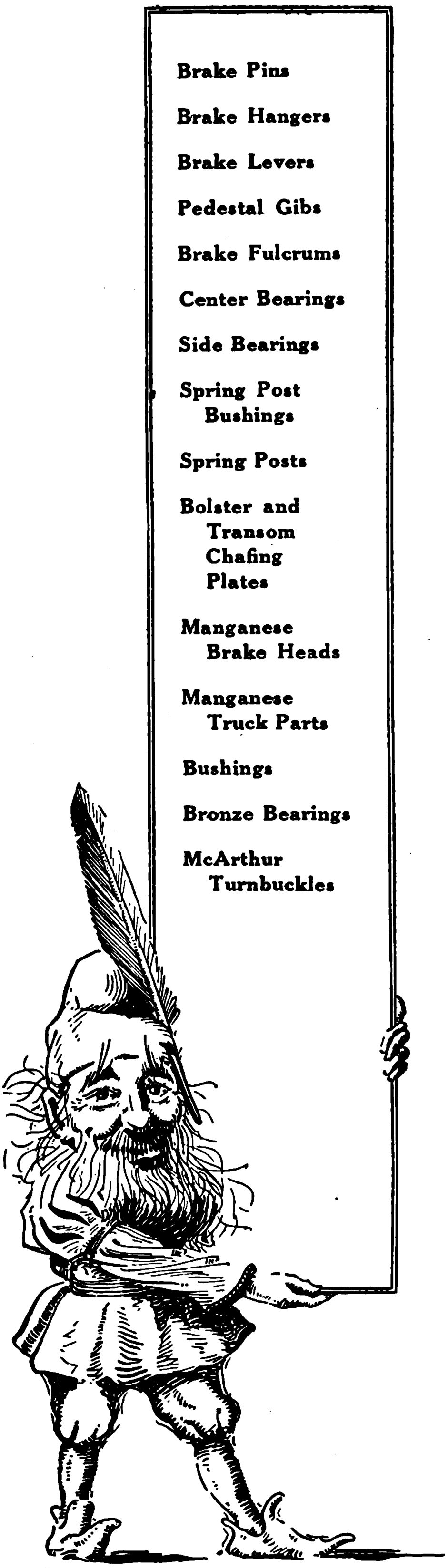

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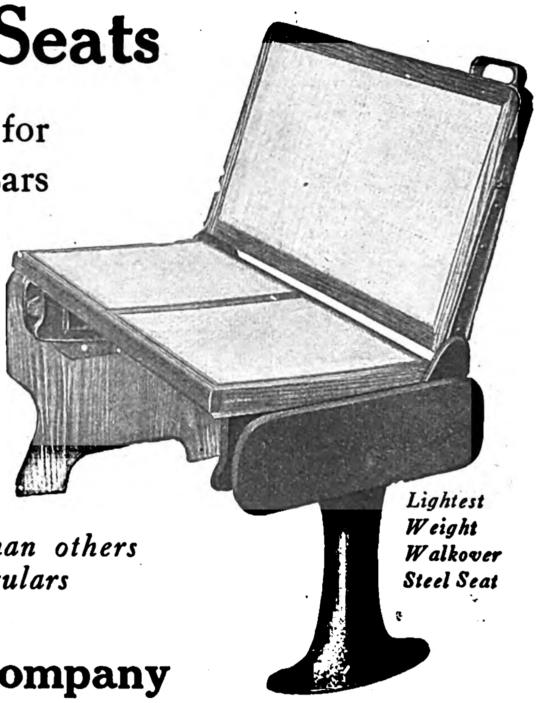

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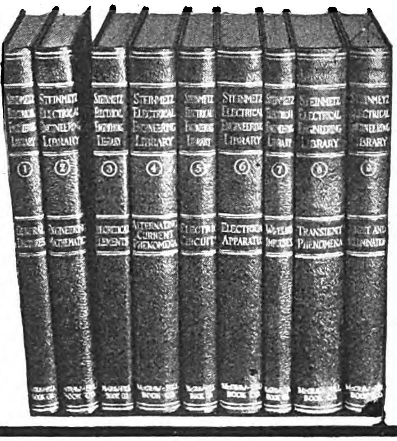

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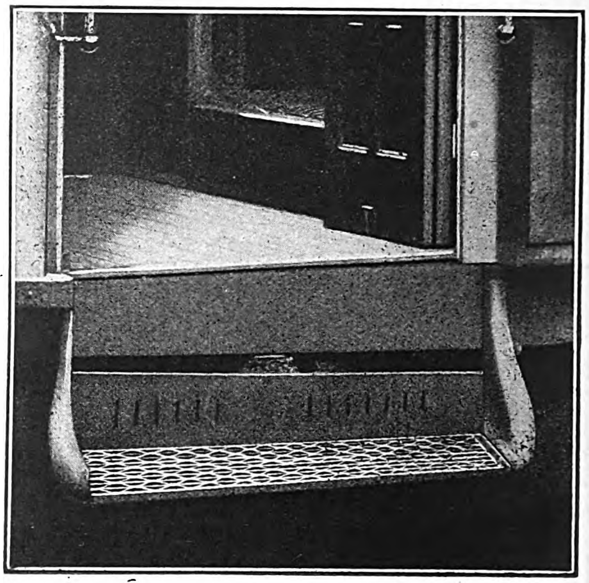

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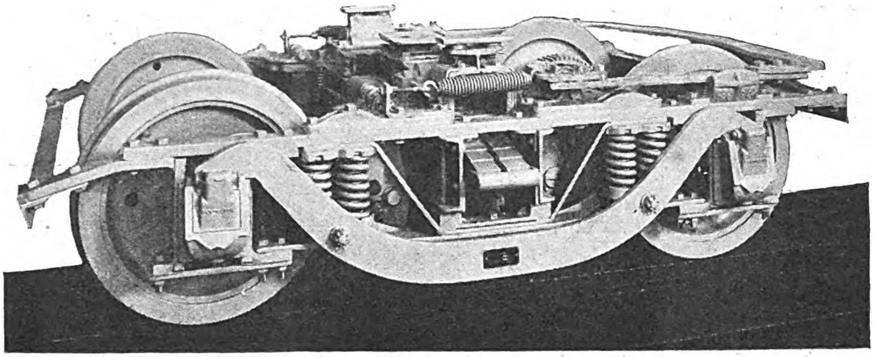
(PATENTED) REG. U.S. PAT. OFF.
THE FIREPROOF VENTILATING FLOORING

Baldwin Motor Trucks on the cars of the Hanshin Kiuko Electric Railway of Japan



Baldwin Truck, Class "78-25" AA

ON a number of Japanese Electric Railways, the equipment calls for Baldwin Motor Trucks, many of which are in use giving full satisfaction.

The illustration shows one of our Class "AA" Trucks, built last year for the Hanshin Kiuko Electric Railway. These trucks meet the most severe conditions of high speed electric interurban and street railway service. Catalogs and detailed information upon request.

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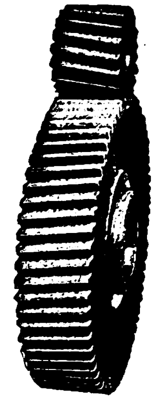

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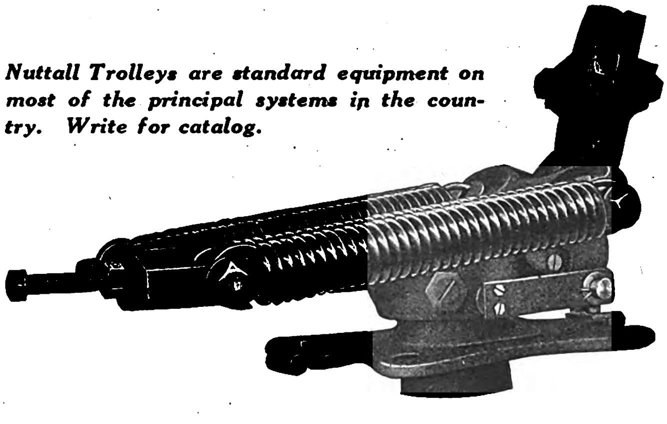
**Are you obtaining maximum efficiency and minimum maintenance cost from your gears? Nuttall Helical Gears insure both.**

*Nuttall Trolleys are standard equipment on most of the principal systems in the country. Write for catalog.*



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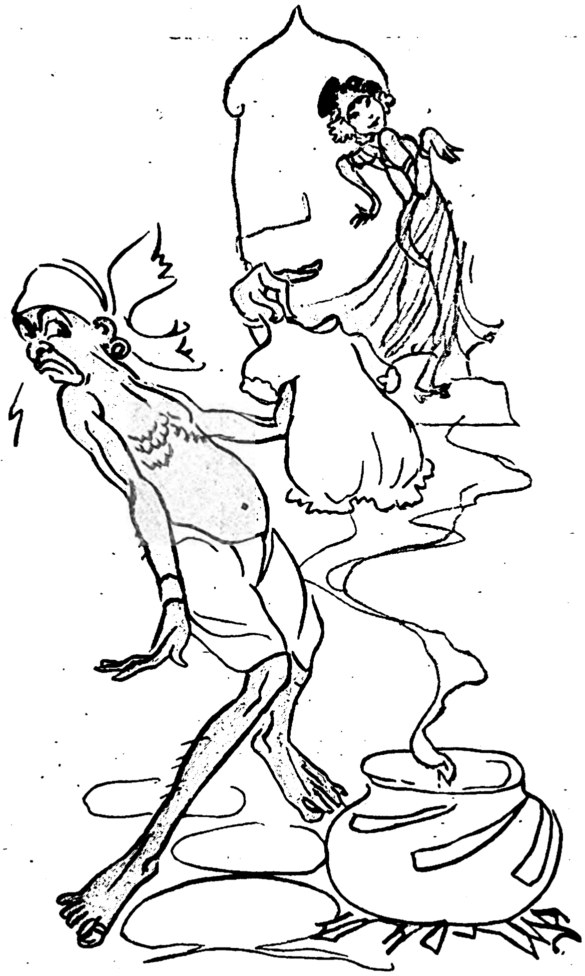
**PITTSBURGH PENNSYLVANIA**

All Westinghouse Electric & Mfg. Co. District Offices are Sales Representatives in the United States for the Nuttall Electric Railway and Mine Haulage Products. In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.



**Cupra**

It has been pointed out that the India native gent is the real lord of the house.

Tho he's keen for a wife, yet, he considers her so far beneath him that it is deep humiliation for him to even touch an article of cupra (the native word for those things we see in lingerie shop windows.)

If you could but get his reasoning, you might under stand why it is that operators hate to consider deeply the carbon brushes on their machines — why they damem instead of making friends withem.

Suggestion: Try getting really acquainted with good brushes — ask one of the Morganite engineers to show you something real vampish in brushes — vampish, but good.

**Morganite Brush Co., Inc.**

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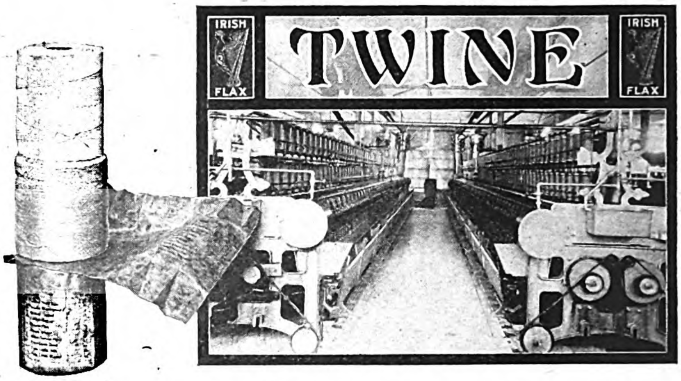

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IRISH FLAX

The Spinning Frames on which are made Shield Brand Pure Linen Armature Twines—every fibre guaranteed genuine Irish Flax.

"LINEN" is not descriptive of twine quality because some "linen" twines are weaker than good cotton. A slender pure linen thread has the same strength but *greater yardage per pound* than a cheaper twine of larger size. Barbour's Irish Flax makes the strongest twine—it may cost a little more per pound but on the basis of *strength and length* it is cheaper.

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*"Everything in Insulation"*

Cable Laid Cotton Armature Twines are used principally to cover leads because their bulk quickly fills a given space and their thickness prevents over-lapping of successive turns. Whether cotton or linen, Shield Brand Twines possess the ultimate in quality.

***Comparative Cost of Cotton and Linen Twines***

***Each Approx. 40 lbs. Tensile Strength***

No. 21 Cable Laid Cotton, .063 in. diam., 900 ft. per lb. 90c. per lb., or 10 ft. for 1c.

6 ply Ordinary "Linen," .025 in. diam., 4000 ft. per lb. $2.50 per lb., or 16 ft. for 1c.

3 ply Shield Brand, .017 in. diam., 6700 ft. per lb. $3.25 per lb., or 20 ft. for 1c.

***Send for Sample Card.***

**Mitchell-Rand Mfg. Co.**
**18 Vesey St., New York, N. Y.**

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MITCHELL-RAND MFG. CO.
"EVERYTHING IN INSULATION"

CABLED HARD FLAX No. 18
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SPECIAL FLAX This size only
BLACK SPECIAL This size only
LINEN SPECIAL 4 Ply
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HARD LINEN 10 Ply
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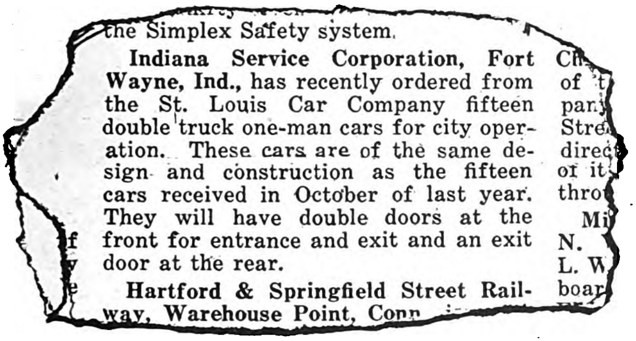
# 15 more for Fort Wayne, Ind.



the Simplex Safety system.

**Indiana Service Corporation, Fort Wayne, Ind.,** has recently ordered from the St. Louis Car Company fifteen double truck one-man cars for city operation. These cars are of the same design and construction as the fifteen cars received in October of last year. They will have double doors at the front for entrance and exit and an exit door at the rear.

**Hartford & Springfield Street Railway, Warehouse Point, Conn**

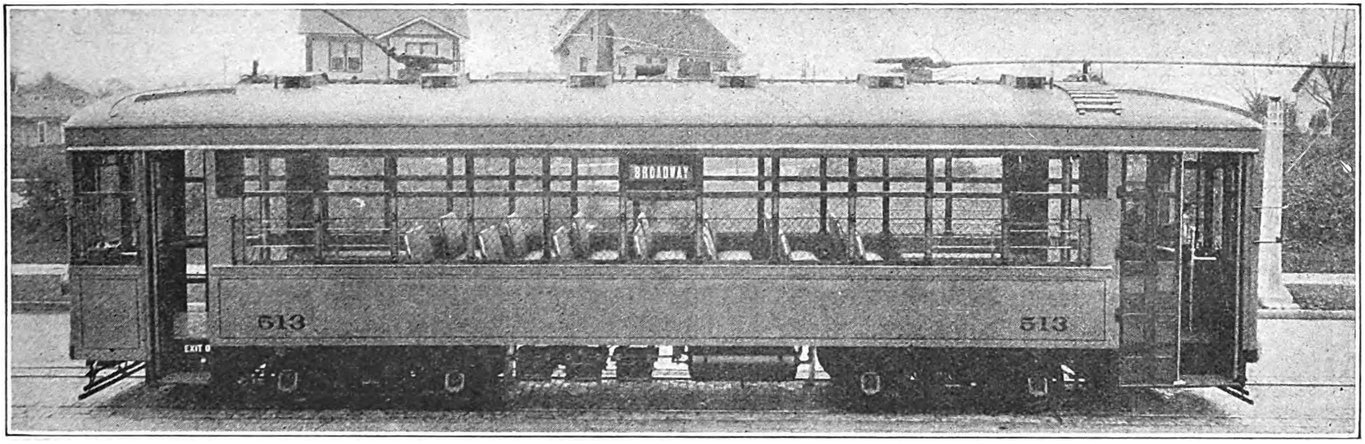
## A Repeat Order for Quality Cars

This is our second lot of fifteen double-truck, one-man city cars for the Indiana Service Corporation of Fort Wayne. They've had the first ones in service since last October—speaks pretty well for St. Louis Quality Cars, doesn't it?

**St. Louis Car Company**

St. Louis, Mo.

*"The Birthplace of the Safety Car"*



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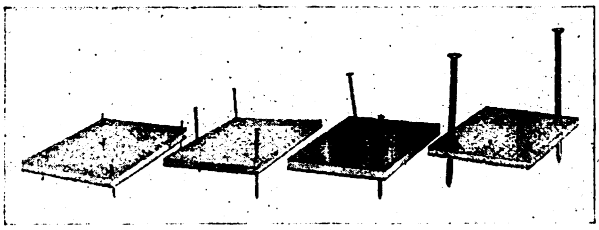
These two tests and others you can make, show why prominent car builders and operating companies throughout the country have adopted Haskelite as the superior material for roofs, headlinings, and interior trim. Its use contributes stiffness and lightness to the structure and is most economical of labor and finishing materials.



*Note how HASKELITE resists splitting when nails are driven close to the edge. The very highest grade of waterproof glue holds the plies together as one piece.*

## *Send for Samples of*
# HASKELITE
## *and make these tests yourself*

*HASKELITE can be boiled in water or oil, and bent to small radius curves. For roof panels and headlinings, it is moulded in steam-heated presses before shipping. The waterproof glue keeps the plies from separating under all conditions.*

HASKELITE MANUFACTURING CORPORATION
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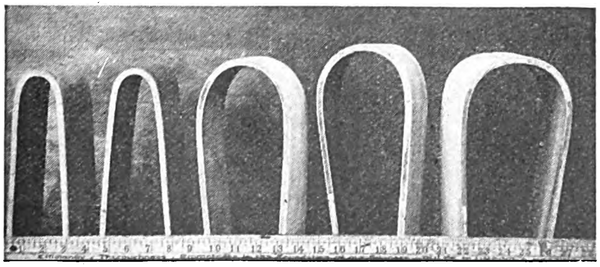
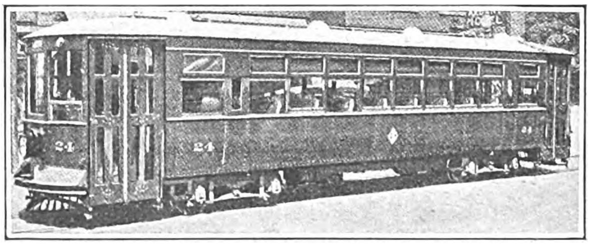


*Youngstown & Suburban cars have HASKELITE roofs and side panels of Plymetl, which is HASKELITE with steel surface.*



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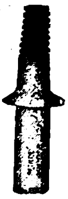

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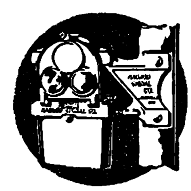

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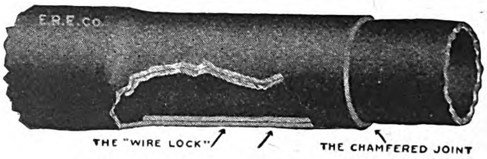

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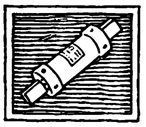

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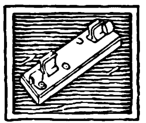

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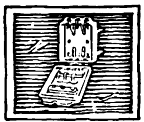

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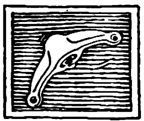

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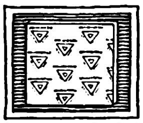

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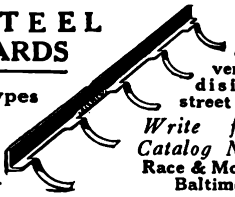

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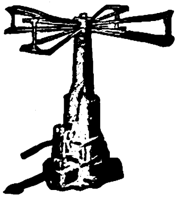

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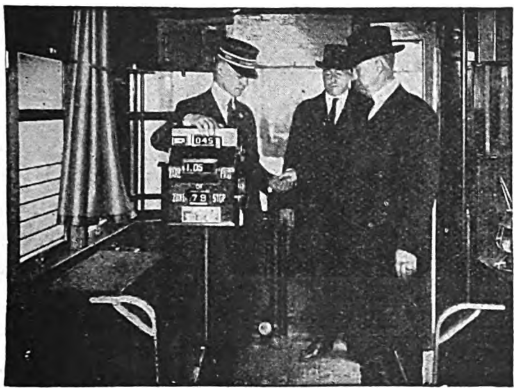

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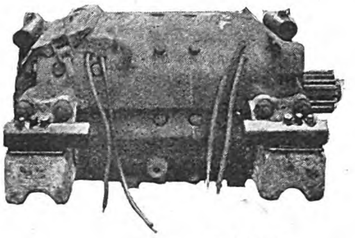

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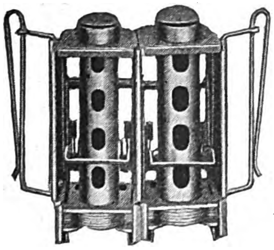

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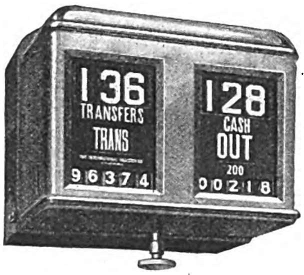

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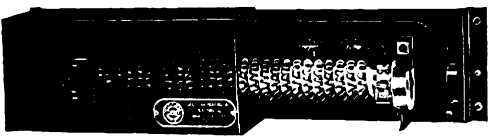

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***Heywood-Wakefield***
**CAR SEATS**
of pressed Steel for all Classes of Passenger Service. Rattan for covering seats and for snow sweepers.
**HEYWOOD-WAKEFIELD CO.**
Factory at Wakefield, Mass.
Offices at New York, Chicago, San Francisco

For detailed description — see — CAR BUILDERS CYCLOPEDIA 1922 Edition

**"OSKELITE"**

The Stop Light for street cars. Operates from brake system. Details on request.

**The Oskel Equipment Co.**
**940 McCormick Bldg., Chicago, Ill.**

**Griffin Wheel Company**
410 North Michigan Ave.
Chicago, Ill.

**GRIFFIN**
**F. C. S.**
**WHEELS**

**For Street and Interurban Railways**

FOUNDRIES:

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| Chicago | Boston | St. Paul |
| Detroit | Kansas City | Los Angeles |
| Denver | Council Bluffs | Tacoma |

**RAILWAY UTILITY COMPANY**
CAR COMFORT WITH **UTILITY** HEATERS REGULATORS VENTILATORS
141-151 West 22d St. Chicago, Ill.
*Write for Catalogue*
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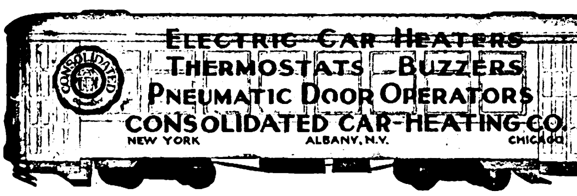
For better Axles Specify
**"VALSCO"**
**HEAT TREATED CAR AXLES**
**LACLEDE STEEL CO.**
Arcade Bldg. St. Louis, Mo.

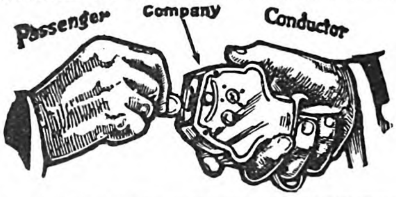
**N-L STOP SIGNAL**
Simple in Operation, Installation and Maintenance
*Canadian Representative:*
Railway & Power Eng. Corp.,
Toronto, Ontario
The Nichols-Lintern Co.
7960 Lorain Ave., Cleveland, Ohio


ELECTRIC CAR HEATERS
THERMOSTATS BUZZERS
PNEUMATIC DOOR OPERATORS
CONSOLIDATED CAR-HEATING CO.
NEW YORK ALBANY, N.Y. CHICAGO

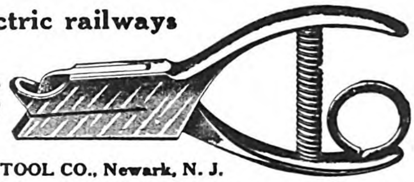
"Tool Steel" = Quality
guaranteed and proven
in
SPUR and HELICAL
gears and pinions.

Tool Steel Quality

The Tool Steel
Gear and Pinion Co.
CINCINNATI, O.



**Direct Automatic Registration By the Passengers**
Rooke Automatic Register Co.
Providence, R. I.

75% of the electric railways
use
**B-V Punches**

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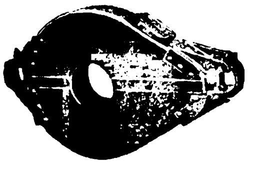
**Car Heating and Ventilation**
are two of the winter problems that you must settle without delay. We can show you how to take care of both, with one equipment. Now is the time to get your cars ready for next winter. Write for details.
**The Peter Smith Heater Company**
6209 Hamilton Ave., Detroit, Mich.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One-Piece Gear Cases
Seamless—Rivetless—Light Weight
Best for Service—Durability and Economy. *Write Us.*
**Chillingworth Mfg. Co.**
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## USED EQUIPMENT & NEW—BUSINESS OPPORTUNITIES

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*Positions Wanted*, 4 cents a word, minimum 75 cents an insertion, payable in advance.

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*Box Numbers* in care of any of our offices count 10 words additional in undisplayed ads.

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*An advertising inch* is measured vertically on one column, 3 columns—30 inches—to a page.

E.F J.

## POSITIONS VACANT

ASSISTANT supervisor of track wanted. Must be practical man; experienced on high speed electric lines. Permanent position. State salary expected. P-708, Elec. Ry. Journal, 10th Ave. at 36th St., New York.

EXPERIENCED track foreman wanted for subway work; permanent position. State salary. P-707, Elec. Ry. Journal, 10th Ave. at 36th St., New York.

## POSITIONS WANTED

A SUPERINTENDENT of a trolley property in the east desires to make a change. Would like interview with managers desiring a highly recommended and capable official. PW-710, Elec. Ry. Journal, 10th Ave. at 36th St., New York.

CAR house foreman, thoroughly experienced in maintenance and overhauling work, wishes to correspond with manager concerning this position. Best references. PW-709, Elec. Ry. Journal, 10th Ave. at 36th St., New York.

ENGINEER of equipment or master mechanic, technical graduate, with several years' manufacturing and operating experience. PW-705, Electric Railway Journal, Old Colony Bldg., Chicago, Ill.

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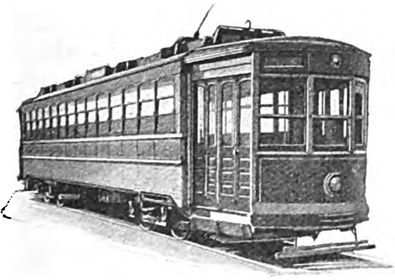
FOR SALE



### 20 ALL STEEL CARS

***Practically New***

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| Length over bumpers | 50 ft. 10 in. |
| Length over corner posts | 36 ft. 6 in. |
| Width over all | 8 ft. 7 in. |
| Height over all | 11 ft. 7½ in. |

Cars are complete and ready for operation including WH air brakes. Seat 52 people.

**TRUCKS**

Standard 050 4 ft., 10-in. wheel base.

**ELECTRICAL EQUIPMENT**

Consists of a 4 WH-514 motors and K35 controllers for double end operation.

**Code "Cun"**

**Transit Equipment Company**

***Cars—Motors***

501 Fifth Avenue, New York

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**FOR SALE**

### INTERURBAN CARS

Ten high-speed standard interurban cars, 55-ft. long, Baldwin trucks, Westinghouse 100 hp. motors. Cars are available on account of adopting cars of lighter weight. Address

FS-706, ELECTRIC RAILWAY JOURNAL,
1570 Old Colony Bldg., Chicago, Ill.

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FOR SALE

**NOW IN SERVICE**

### 20 CARS COMPLETE

**30-ft. bodies; seat 44, Brill 27-F trucks; West. 101-B or 307 motors. Low Price.**

**ELECTRIC EQUIPMENT CO.**
**601 Commonwealth Bldg., Philadelphia, Pa.**

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**When you need new or relaying rails, come to headquarters and get just what you want, in any quantity, and get them quick.**

We always have a big stock of rails, from 12 lbs. to 100 lbs. per yard, for immediate delivery. Every rail inspected and guaranteed. Complete with the necessary angle bars.

When it comes to price we are also headquarters—we have complete stocks of new and relaying rails of all weights available for prompt shipment located in thirty convenient distributing points throughout the United States, Canada and Cuba—which in turn means we can make immediate shipments at unbeatable prices to our customers. "Tons of Rails Right at Your Door." Write, 'phone or wire us your requirements.

**HYMAN-MICHAELS COMPANY**

*"The House of Dependable Service"*

**122 South Michigan Avenue, Chicago**

**Dealers in New and Relaying Rails, Locomotives and Railway Equipment**

***District Offices:*** **New York, Woolworth Bldg.; St. Louis, Railway Exchange Bldg.; Pittsburgh, First Nat'l Bank Bldg.; Detroit, Book Bldg.; San Francisco, 234 Steuart St.**

***Yards:*** **St. Louis, East Chicago, Ind., McKee's Rocks, Pa., San Francisco.** ***Cable Address:*** **"Hymanmikel"**

***World's Largest Distributors of Rails***

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### Air Compressors For Sale

1—Laidlow Dunn Gordon Air Compressor; steam size 5 in. (Corliss Type Poppet Valve) 15½ in. diameter high pressure cylinder, 25 in. diameter low pressure cylinder, 36-in. stroke. Air cylinder 16 in. high pressure, 26 in. low pressure, 6-in. air line; capacity 2200 cu. ft. at 110 lbs.

1—Chicago Pneumatic Tool Company Air Compressor (Slide Valve) Steam Pipe 5 in.; 20 in. high pressure, 31 in. low pressure, 24-in. stroke. Air 16½ in. high pressure, 27 in. low pressure; 6-in. air line; 1580 cu. ft. of air per minute of 100 lbs.

*Call or Write,*

**J. F. TORRENCE**

3722 Fifth Avenue, Pittsburgh, Pa.

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**WANTED**

### 2 S[illegible]s Brill 27 M. C. B. 2 X Trucks

**TEXAS ELECTRIC RAILWAY.**
Dallas, Texas

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FOR SALE

### PAVING BLOCKS

One million second-hand granite paving blocks, 4-in. wide, 8-in. deep and 8-in. to 12-in. long. Very desirable for re-cutting or could be used in their present condition.

Offered, subject to prior sale, at $40 a thousand, f.o.b. cars Warwick, R. I.

**E. H. BILLINGE,** ***Purchasing Agent,***
**United Electric Railways Company**
Providence, R. I.

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FOR SALE

### Boiler Feed Pumps

2—Worthington pot valve duplex, 14x8½ x15, fitted with brass rods, in good working condition, ready to operate 250 lb. pressure, can ship immediately.

**LEXINGTON UTILITIES COMPANY**
Lexington, Kentucky.

# WHAT AND WHERE TO BUY

**Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue**

**Advertising, Street Car**
Collier, Inc., Barron G.

**Air Receivers & Aftercoolers**
Ingersoll-Rand Co.

**Anchors, Guy**
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Anti-Climbers**
Railway Improvement Co.

**Armature Shop Tools**
Elec. Service Supplies Co.

**Automatic Return Switch Stands**
Ramapo Ajax Corp.

**Automatic Safety Switch Stands**
Ramapo Ajax Corp.

**Axles**
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.
Johnson & Co., J. R.
Laclede Steel Co.
St. Louis Car Co.
Westinghouse E. & M. Co.

**Badges and Buttons**
Elec. Service Supplies Co.
International Register Co., The

**Barges, Steel**
American Bridge Co.

**Bearings and Bearing Metals**
Bemis Car Truck Co.
Brill Co., J. G., The
General Electric Co.
Gilbert & Sons B. F. Co., A.
More-Jones Brass & Metal Co.
St. Louis Car Co.
Westinghouse E. & M. Co.

**Bearings, Center and Roller Side**
Baldwin Locomotive Works
Stucki Co., A.

**Bells and Gongs**
Brill Co., The J. G.
Consolidated Car Heati'g Co.
Elec. Service Supplies Co.
St. Louis Car Co.

**Boilers**
Babcock & Wilcox Co.

**Bonding Apparatus**
Amer. Steel & Wire Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Track-work Co.

**Bonds, Rail**
Amer. Steel & Wire Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Track-work Co.
Westinghouse E. & M. Co.

**Book Publishers**
McGraw-Hill Book Co.

**Boxes, Switch**
Johns-Pratt Co.

**Brackets and Cross Arms (See also Poles, Ties, Posts, Etc.)**
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.

**Brake Adjusters**
Brill Co., The J. G.
National Ry. Appliance Co
Westinghouse Tr. Br. Co.

**Brake Shoes**
Amer. Br. Shoe & Fdy. Co.
Bemis Car Truck Co.
Brill Co., The J. G.
St. Louis Car Co.

**Brakes, Brake Systems and Brake Parts**
Allis-Chalmers Mfg. Co.
Bemis Car Truck Co.
Brill Co., The J. G.
General Electric Co.
National Brake Co.
Safety Car Devices Co.
St. Louis Car Co.
Westinghouse Tr. Br. Co.

**Bridges, Steel**
American Bridge Co.

**Brushes, Carbon**
General Electric Co.
Jeandron, W. J.
Le Carbone Co.
Morganite Brush Co.
U. S. Graphite Co.
Westinghouse E. & M. Co.

**Brushes, Graphite**
Morganite Brush Co.
U. S. Graphite Co.

**Brush Holders**
Anderson Mfg. Co., A. & J. M.

**Brushes, Wire, Pneumatic**
Ingersoll-Rand Co.

**Buildings, Steel**
American Bridge Co.

**Buses, Motor**
Brill Co., The J. G.
St. Louis Car Co.

**Bushings, Case Hardened and Manganese**
Bemis Car Truck Co.
Brill Co., The J. G.
St. Louis Car Co.

**Cables. (See Wires and Cables.)**

**Cambric Tapes, Yellow and Black Varnish**
Irvington Varnish & Ins. Co.

**Carbon Brushes (See Brushes Carbon)**

**Cars, Dump**
Brill Co., J. G., The
Differential Steel Car Co.
St. Louis Car Co.

**Car Lighting Fixtures**
Elec. Service Supplies Co.

**Car Panel Safety Switches**
Consolidated Car Heati'g Co.
Westinghouse E. & M. Co.

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Amer. Car Co.
Brill Co., The J. G.
Kuhlman Car Co., G. C.
McGuire-Cummings Mfg. Co.
National Ry. Appliance Co.
St. Louis Car Co.
Wason Mfg. Co.

**Cars, Gas, Rail**
Brill Co., J. G., The
St. Louis Car Co.

**Cars, Second Hand**
Electric Equipment Co.
Transit Equipment Co.

**Cars, Self-Propelled**
Brill Co., J. G., The
General Electric Co.

**Car Steps Safety**
Irving Iron Works

**Car Wheels, Rolled Steel**
Bethlehem Steel Co.

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More-Jones Brass & Metal Co.

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Bemis Car Truck Co.
St. Louis Car Co.

**Castings, Malleable and Brass**
Amer. Br. Shoe & Fdy. Co.
Bemis Car Truck Co.
St. Louis Car Co.

**Catchers and Retrievers, Trolley**
Elec. Service Supplies Co.
Ohio Brass Co.
Wood Co., Chas. N.

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Archbold-Brady Co.

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Pantasote Co., Inc.

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Haskelite Mfg. Co.

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Cleveland Fare Box Co.

**Circuit-Breakers**
General Electric Co.
Westinghouse E. & M. Co.

**Clamps and Connectors for Wires and Cables**
Anderson Mfg. Co., A. & J. M.
Elec. Ry. Equipment Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Cleaners and Scrapers Track (See also Snow-Plows, Sweepers and Brooms)**
Brill Co., The J. G.
St. Louis Car Co.

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General Electric Co.

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**Coasting Recorders**
Railway Improvement Co.

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Elec. Service Supplies Co.

**Coils Armature and Field**
General Electric Co.
Westinghouse E. & M. Co.

**Coils, Choke and Kicking**
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

**Coin Counting Machines**
Cleveland Fare Box Co.
Intern'l Register Co.
Johnson Fare Box Co.

**Coin Sorting Machines**
Cleveland Fare Box Co.

**Coin Wrappers**
Cleveland Fare Box Co.

**Commutator Slotters**
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

**Commutator Truing Devices**
General Electric Co.

**Commutators or Parts**
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General Electric Co.
Westinghouse E & M. Co.

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Allis-Chalmers Mfg. Co.
General Electric Co.
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Westinghouse Tr. Br. Co.

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Ingersoll-Rand Co.

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Irving Iron Works

**Concrete Reinforcing Bars**
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General Electric Co.
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Westinghouse E. & M. Co.

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Consolidated Car Heat. Co.
Elec. Service Supplies Co.
Ohio Brass Co.

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General Electric Co.
Westinghouse E. & M. Co.

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Elec. Service Supplies Co.

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Westinghouse E. & M. Co.

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General Electric Co.
Westinghouse E. & M. Co.

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Anaconda Copper Mining Co.

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Elec. Service Supplies Co.
Internat'l Register Co., The
Roebling's Sons Co., John A.
St. Louis Car Co.
Samson Cordage Works

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Samson Cordage Works
Wood Co., Chas. N.

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Ohio Brass Co.
St Louis Car Co.
Westinghouse Tr. Br. Co.

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American Engineering Wks.

**Cross Arms (See Brackets)**

**Crossing Foundations**
International Steel Tie Co.

**Crossing, Frog & Switch**
Ramapo Ajax Corp.

**Crossing, Manganese**
Bethlehem Steel Co.
Ramapo Ajax Corp.

**Crossings**
Ramapo Ajax Corp.

**Crossings, Track (See Track, Special Work)**

**Crossings, Trolley**
Ohio Brass Co.

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Morton Mfg. Co.
Pantasote Co., Inc.
St. Louis Car Co.

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Transit Equipment Co.

**Derailing Devices (See also Track Work)**

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Ramapo Ajax Corp.

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Elec. Service Supplies Co.

**Detective Service**
Wish-Service, P. Edward

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General Electric Co.
Hale-Kilburn Co.
Nat'l Pneumatic Co., Inc.
Safety Car Devices Co.
St. Louis Car Co.

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Consolidated Car Heati'g Co.
General Electric Co.
Hale-Kilburn Co.
Morton Mfg. Co.

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Nat'l Pneumatic Co., Inc.
Safety Car Devices Co.

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Ingersoll-Rand Co.

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Elec. Service Supplies Co.
Ingersoll-Rand Co.
Ohio Brass Co.

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Elec. Service Supplies Co.

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Ohio Brass Co.

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Amer. Steel & Wire Co.
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Drum & Co., A. L.
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Jackson, Walter
Ong, Joe R.
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Railway Audit & Inspection Co.
Richey, Albert S.
Robinson & Co., Dwight P.
Sanderson & Porter
Stevens & Wood
Stone & Webster
White Eng. Corp., The J. G.
Wortham, Edwin

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Ingersoll-Rand Co.
Westinghouse E. & M. Co.

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Cyclone Fence Co.

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**Flooring, Non-Slipping**
Irving Iron Works

**Flooring, Open Steel**
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Irving Iron Works

**Flooring Ventilating**
Irving Iron Works

**Forgings**
Brill Co., J. G., The

**Frogs & Crossings, Tee Rail**
Bethlehem Steel Co.
Ramapo Ajax Corp.

**Frogs, Track (See Track Work)**

**Frogs, Trolley**
Ohio Brass Co.

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American Bridge Co.

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General Electric Co.
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Johns-Pratt Co.

**Fuses, Refillable**
General Electric Co.
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Johns-Pratt Co.

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Westinghouse E. & M. Co.

**Gas-Electric Cars**
General Elec. Co.
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Brill Co., The J. G.
St. Louis Car Co.

**Gear Blanks**
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Brill Co., J. G., The

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Nat'l Ry. Appliance Co.
Nuttall Co., R. D.
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General Electric Co.

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General Electric Co.
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Bethlehem Steel Co.
Lorain Steel Co.

**Gong (See Bells and Gongs)**

**Grating, Steel Subway**
Irving Iron Works

**Greases (See Lubricants)**

**Grinders and Grind. Supplies**
Railway Track-work Co.

**Grinders, Portable**
Railway Track-work Co.

**Grinders, Portable Electric**
Railway Track-work Co.

**Grinding Bricks and Wheels**
Railway Track-work Co.

**Guard Rail Clamps**
Ramapo Ajax Corp.

**Guard Rails, Tee Rail & Manganese**
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Elec. Service Supplies Co.
Ohio Brass Co.

**Hammers, Pneumatic**
Ingersoll-Rand Co.

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Elec. Service Supplies Co.
More-Jones Brass Metal Co.
Nuttall Co., R. D.
Star Brass Works

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General Electric Co.
Ohio Brass Co.
St Louis Car Co.

**Headlining**
Haskelite Mfg. Co.
Pantasote Co., Inc.
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Gold Car Heat. & Ltg. Co.
Nat'l Ry. Appliance Co.
Smith Heater Co., Peter

**Heaters, Car, Hot Air and Water**
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**Helmets—Welding**
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Westinghouse E. & M. Co

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General Electric Co.
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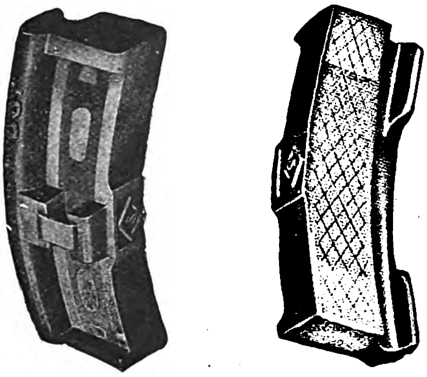
AERA Standards
Brake Heads



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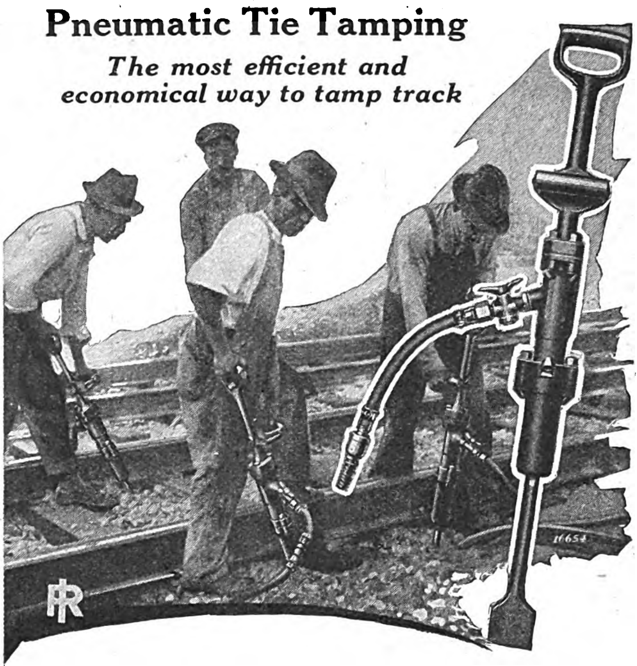

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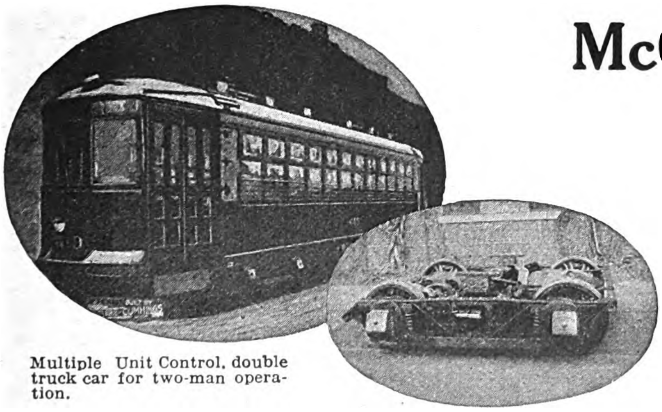

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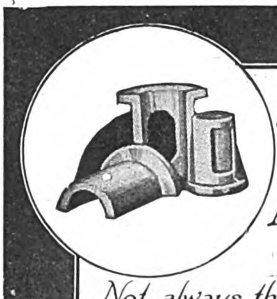

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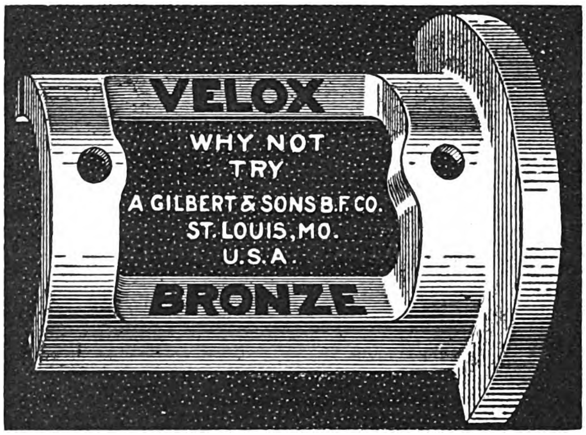

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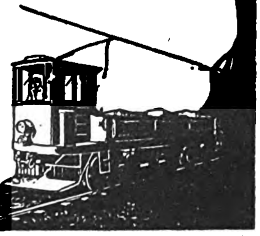

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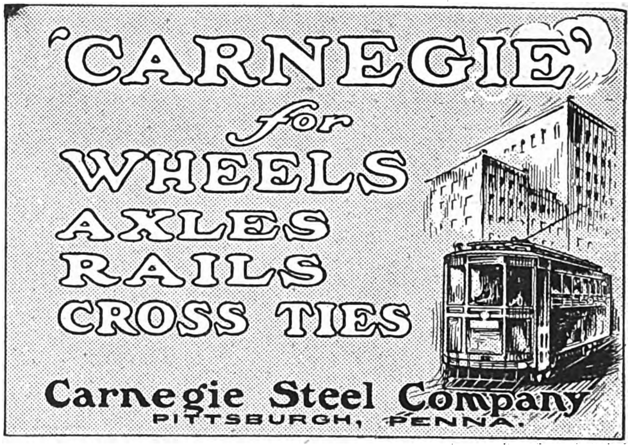

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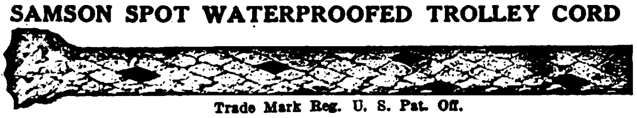

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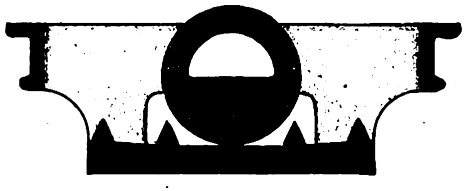

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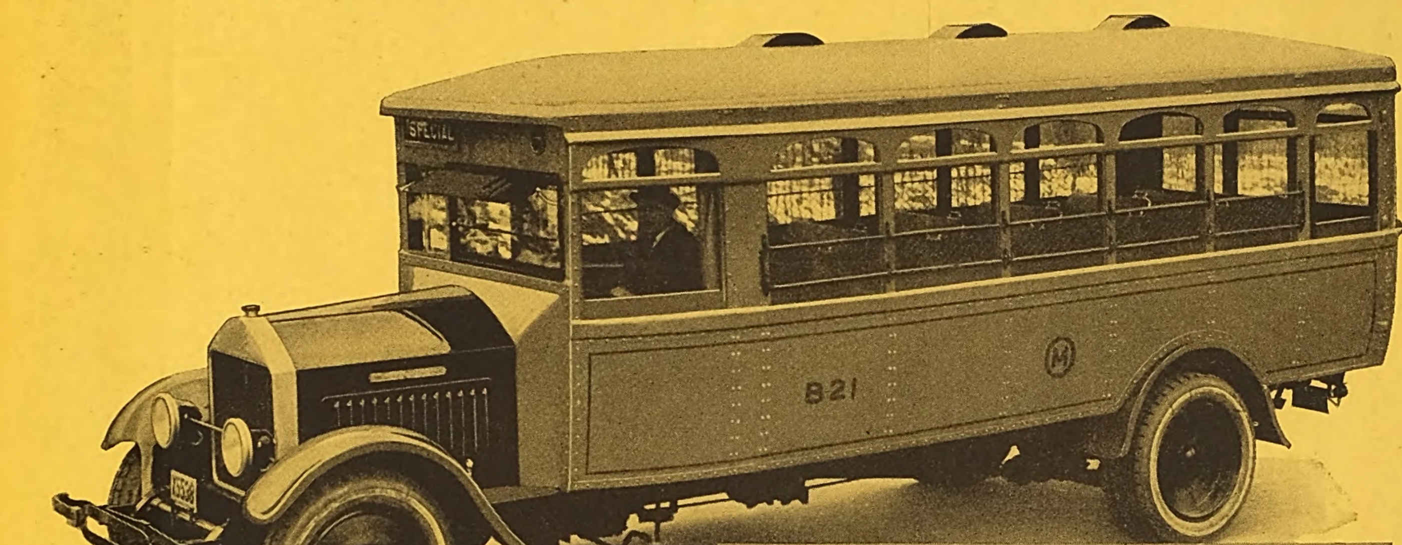

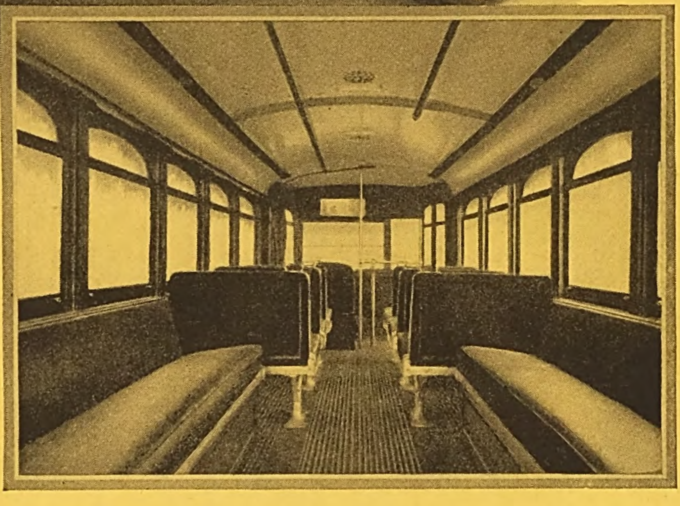

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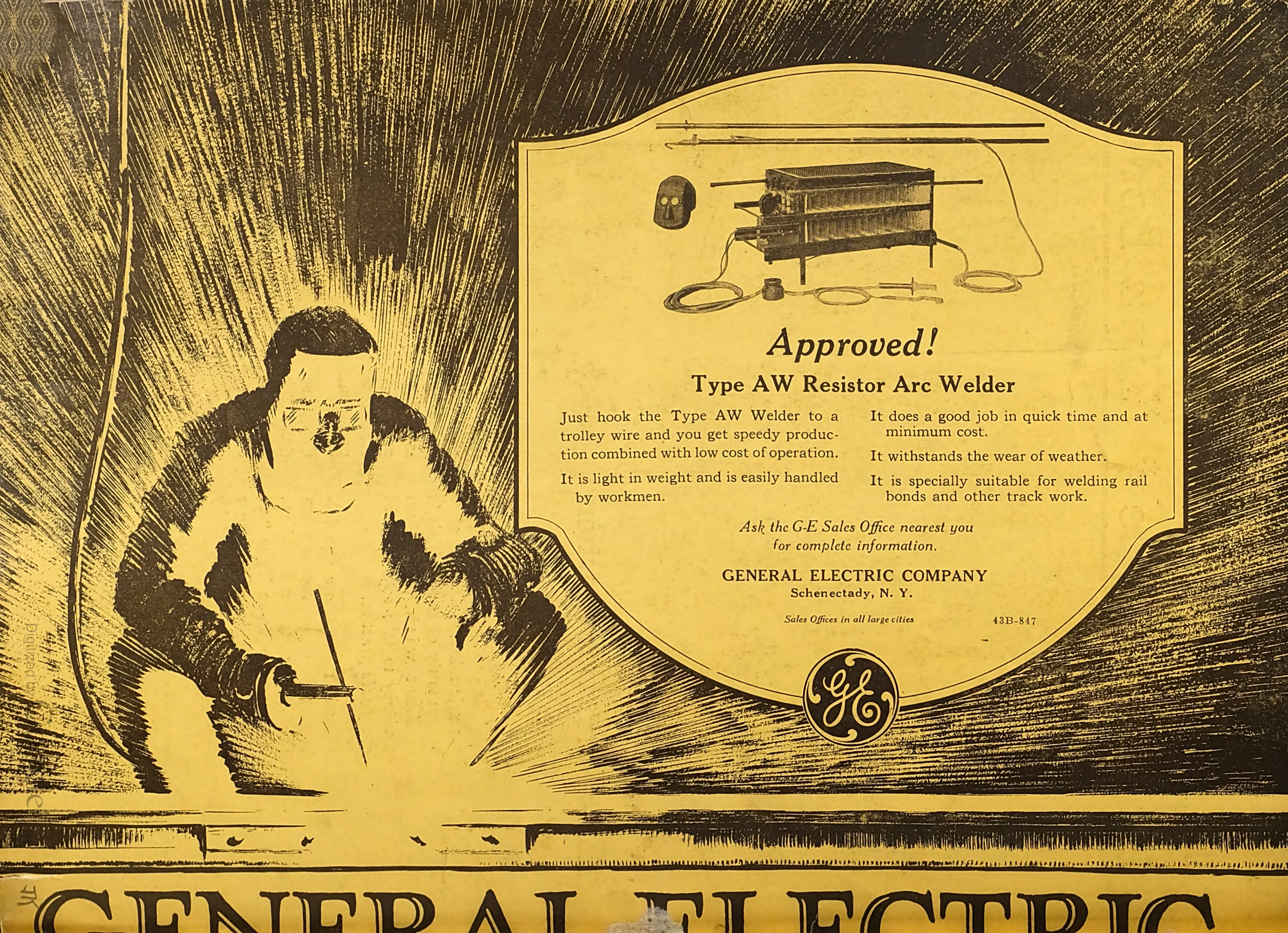

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